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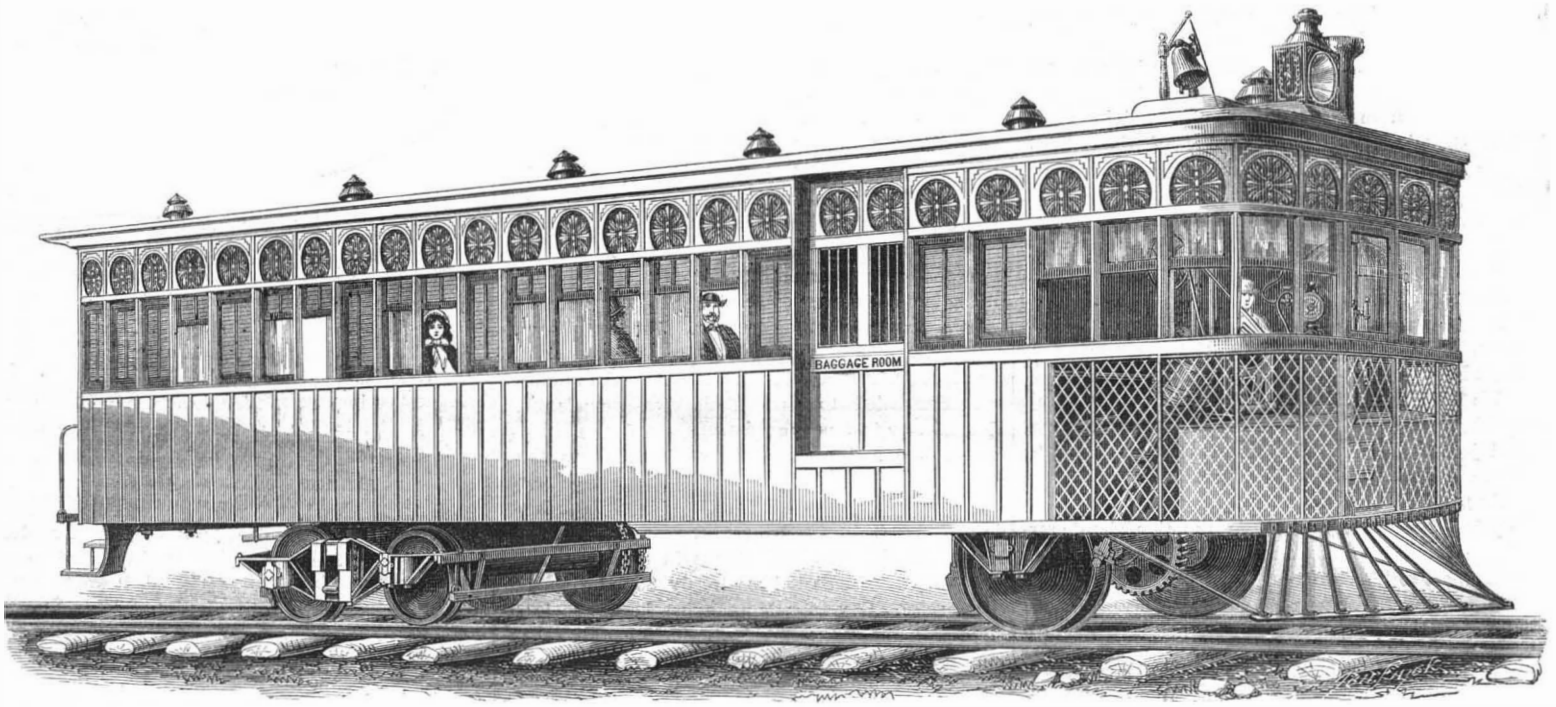
Steam Carriages for Railways.

Common locomotives are unsuited for drawing light trains, without incurring expenses disproportionate to the receipts. Most of our locomotives are capable of drawing four, five and a greater number of passenger cars at a great speed, and yet one of them must be "harnessed up" when only one car may be required for all the passengers of a train. A compact, cheap and economical steam carriage, suitable for an entire light train, has long been sought, and at last produced by Messrs. Grice & Long, of 114 Walnut street, Philadelphia, who have also an office at 94 Wall street, New York. A steam carriage constructed by them upon the principle embraced in the patent granted to Mr. R. H. Long, in the month of January, 1860, has been running for some weeks on the Camden and Amboy Railroad.



GRICE AND LONG'S STEAM CARRIAGE FOR RAILWAYS.

The above engraving illustrates one of the cars recently constructed by Messrs. Grice & Long, for the Camden and Amboy Railroad Company. The engine, baggage and passenger cars are combined in one, measuring 37½ feet in length, and capable of seating thirty-six passengers. Engine, boiler and coal boxes occupy less space than the front platform of an ordinary passenger car. There are two cylinders at one side, each six inches in diameter, stroke ten inches, set on an angle of about 30°. These are secured in a strong iron frame, with the connecting rod yoked to cranks on a brass pinion, which is secured to the end of the engine. The pinion gears into a cog wheel on the shaft of the driving wheel, thus transmitting motion to the car. A vertical tubular boiler, only 28 inches in diameter, is situated at the other side of the platform, and there is a space left between the cylinders and boiler for the engineer, who has an unobstructed view of the road before him. In front of the boiler and engine are located the coal bunkers, which contain sufficient fuel for a fifty-mile trip. Immediately in rear of the engine and boiler is the baggage room, under the floor of which is the water tank, containing a supply of feed for a trip of 35 miles. The entire space, fore and aft, occupied by the engine, boiler and machinery is only 32 inches, and the weight of the carriage and machinery is only eleven tuns. On the above road it has run at the rate of 30 miles per hour with the consumption of seven pounds of coal to the mile. We apprehend that the time is not far distant when passenger cars, combining the engine and baggage crate, will become general on most of our small railroads.

TESTING IRON FOR SHEATHING GUNBOATS.

The St. Louis *Democrat* describes experiments lately made to test the iron plates manufactured by Messrs. Gaylord, Son & Co., of St. Louis, for sheathing the new gunboats intended for operations on the Mississippi. The plates were thirteen inches wide, 2½ inches thick and varied in length from eight to eleven feet long. It being desirable to ascertain the resisting power of this iron against artillery projectiles, it was determined by Capt. Rogers and Major Merritt, Chief Engineer of the machinery, to try the force of rifled cannon shot upon it. For this purpose, the *Democrat* states, two of the most powerful rifled guns, under superintendence of Lieut. Buffington, of the arsenal, were conveyed over the river, opposite the Carondelet docks, on the Illinois side. There, on the sandy beach, a range of about three miles for the balls to fly was obtained. The iron plates for the experiment were firmly bolted to oak blocks about sixteen inches thick and stationed in a firm position at an angle of 45°, and inclination the same as that of the gunboats.

Lieut. Buffington placed his gun at a range of eight hundred yards. The target was so small for so great a distance that it was difficult to see it, but by the aid of a spyglass some good shots were made. A Parrot rifled gun was used. The first ball struck the iron under one of the bolts, tearing it out without injury to the iron, only making its mark in a raking way. The next shot that hit the iron was fired at a distance of five hundred yards. This made a very decided mark, indenting the iron one inch. The next shot at five hundred yards hit fair, and also made a dent about one inch deep, starting all the bolts. Next they came up to three hundred yards distance, and the effect on the iron was the same each time, a deep indentation being made, but not a crack or sign of breaking. Then the party said they would see if a ball could be put through, so the iron target was set up straight, or a little leaning towards the gun, which was placed only one hundred yards off. All said it must go through. The ball hit fair in the center, knocking the target around out of its place, and shattering the ball in a thousand fragments, many pieces flying back to the gun.

It was now deemed unsafe to try it at shorter range. Capt. Rogers and all hands decided that the iron resisted beyond all expectations, and proved to be of a very superior quality, and it was pronounced perfectly satisfactory.

The Rolling of the Great Eastern.

While the *Great Eastern* was lying disabled in the trough of the sea, the angle through which she rolled was carefully measured by Mr. Towle, till it reached 35° each way, making an oscillation through 70°. It surpassed this somewhat, but how much this engineer was unable to determine, as the violence of the motion prevented him from continuing his measurements. From six to eight oscillations occurred in a minute, and they continued from thirty to sixty consecutively, when the vessel would become steady for a brief space.

Our readers who have been on board the great ship will remember the giddy hight at which the boats were suspended above the water. The vessel rolled down so far as to strike these boats against the water and destroy them.

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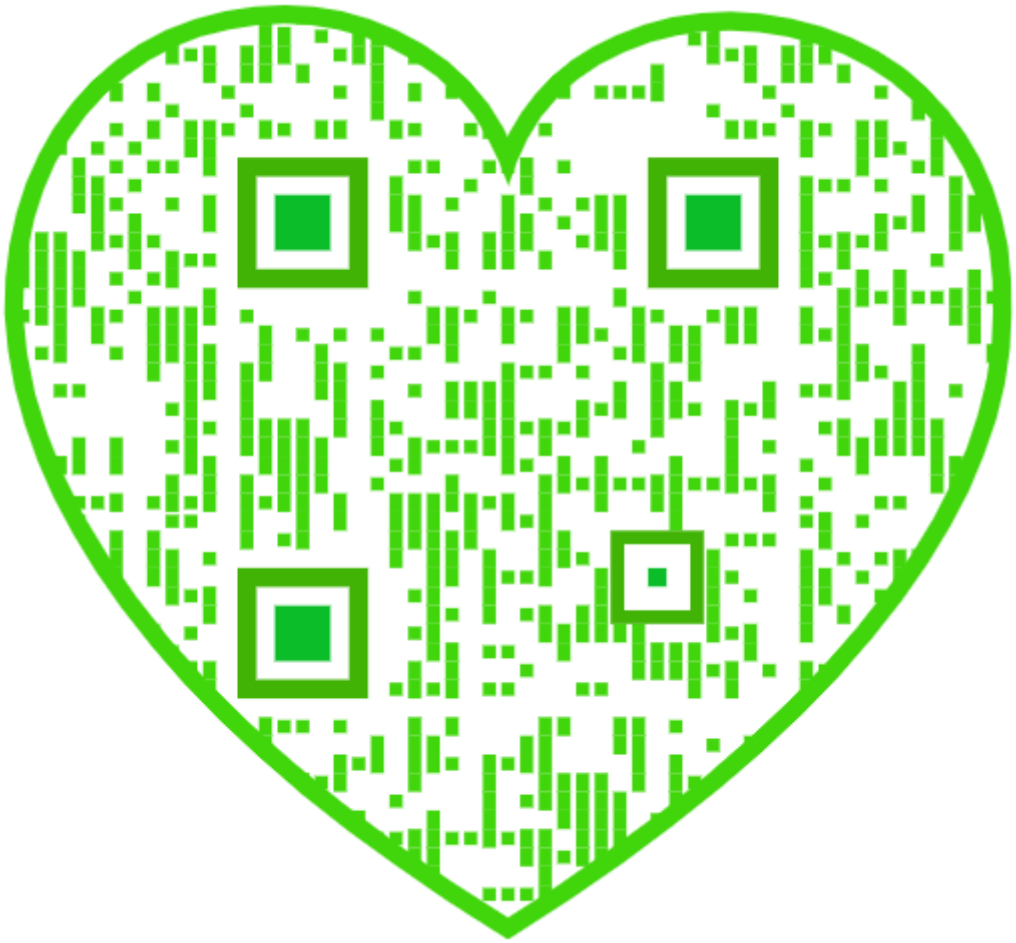

THE WAR.

THE SITUATION.

The general situation of affairs remains about the same as last week at this time. There has been a good deal of activity in the army and navy departments, and several skirmishes have taken place, but no serious battle has yet been fought. The outposts of the Federal army on the Potomac have been extended further into Virginia, and General McClellan is evidently prepared for an advance. A powerful expedition is about to proceed to the southern coast, but to what point the public is wholly ignorant. The Federal army in Kentucky, under command of General Sherman, is rapidly augmenting. The loyal people of that State are uniting by thousands with the forces from Ohio, Indiana and Illinois, and soon a large army will be in the field. General Price is retreating before the advance of General Fremont's column, but to what point it is impossible to conjecture. It is reported that his army is becoming disorganized, and many are returning home, sick of the campaign. Nothing new has occurred in Western Virginia. It is believed that our forces there are equal to anything that can be brought against them ; but it will not do to rely upon such convictions. The enemy of the government is at work with a vigilant determination to achieve success, and by vigilance only can his plans be frustrated.

We present the following summary of the news of the week :—

A report from New Orleans *via* Virginia, states that Captain Hollins, commander of the Confederate gun-boats of that city, had attacked, on the 11th inst., the Federal fleet, and succeeded in driving the vessels aground on the southwest pass bar, and sinking the sloop-of-war *Preble*. This story is not fully credited here, as it comes from secession sources; but we incline to the opinion that an engagement has taken place, and that it is possible the *Preble* was sunk. Intelligence from the fleet there is anxiously looked for.

We announced in our last number that Capt. Smith, formerly Street Commissioner of this city, had joined the secessionists. Late news from the South states that Capt. Mansfield Lovell, a deputy acting under Smith in the Street Department, has been appointed Brigadier General in the Confederate service, stationed in Louisiana. We have now before us a report to the Common Council, emanating from this *patriot*, dated July 2, in which he signs himself deputy and acting Street Commissioner. Both Smith and Lovell seem to have gathered considerable dirt while in office here.

Our readers are aware that on the 3d inst. the propeller *Fanny* was seized by the secessionists while she was on her way to furnish supplies to Federal troops on Hatteras island. We lost by the operation some seventy men taken prisoners, also army supplies valued at about $35,000. This little success emboldened the secessionists to try and do something greater ; so on the day after the seizure of the *Fanny* they undertook to seize and destroy Hatteras Light. In this operation they got much more than they expected. The gunboat *Monticello* steamed around the cape and met the enemy coming down a narrow neck of land for the purpose of making the assault. She opened a most terrific fire of shells upon them, when they scattered like chaff, having sustained a very heavy loss in men and officers. The *Fanny* was disabled, and the sloops loaded with men were sunk by shells falling into them. In order that our readers may fully understand this affair we will explain a little. Chicamacomico is some twenty miles above Fort Hatteras, on the inner shore of Hatteras Island. Col. Brown's Twentieth Indiana Regiment was encamped at this place. The secessionists undertook to surround him, and with this view sent some 2,500 men across the inlet—a part to be landed above and a part below Col. Brown's encampment. The island is a sand ridge, not over one mile wide, covered here and there with scrub oak and holly. The United States gunboat *Monticello* steamed up from the fort, and took up a position on the outside and bombarded the enemy and his vessels with a terrific fire across the island. The Twentieth Indiana Regiment, Col. Brown, narrowly escaped being taken prisoners. At one time hey were nearly surrounded, and their retreat almost cut off. It should be stated that the *Fanny* was not in the government service, and therefore not commanded by naval officers.

Gen. Wise, at one time Governor of Virginia, and who came very near upsetting the equipoise of the earth at the time of the raid of John Brown into that State, plunged into this war with such violence that it required several men to hold him ; but he has cut a sorry figure, and has turned out a very poor fighter. At the outset of his sanguinary career he very nearly killed his troops and the suffering inhabitants of his military department by long, windy proclamations and speeches. When he saw the Federal troops approaching he took to his heels and ran, like the wild man of the mountains. The latest news we have of this military brave is that he had been ordered to report at the War Department at Richmond, and would probably be court-martialed. Floyd, the most consummate villain of modern times, has also showed poor fighting qualities. He is evidently a more adroit thief than a soldier, and, strange to say, his army is *demoralized*. Gen. Lee has been placed in command of the forces of Wise and Floyd. He is a good officer, but, according to the latest reports, he seems not to have had much better success than Floyd and Wise. Generals Reynolds and Rosecrans of the Federal forces are evidently too much for these Virginia Generals.

On the 6th inst. fifty-seven prisoners, accompanied by Surgeons Howiston and Swalm, reached Fortress Monroe under a flag of truce. They assert that from one to three of our wounded die daily from the want of proper attendance, and that there is a lack of proper medicines and hospital appointments. The hospitals are crowded, and hospital gangrene has made its appearance, which increased the number of fatal cases. This comes from overcrowded, filthy and improperly ventilated rooms. Little or nothing has been done to provide clothing for our wounded. Carpeting is used as blankets, and our men are much in want of most articles of comfort. There was a general lack of dressing material, such as sticking-plaster, bandages and lint, and in many instances the wounded were compelled to dress their own wounds. In almost every instance the instruments of our surgeons were seized and confiscated by the rebels to their own use.

The militia force of the State of New York is set down at 776,344 men. Governor Morgan states that New York will have 100,000 men in the field within thirty days. The State has already 83,631 troops in the service. Governor Morgan has been appointed Major General by the President. This has stirred up the other Governors, and they all want to be treated to the same honor.

A British steamer, the *Bermuda*, recently ran the blockade at Savannah, and it is reported that her freight was 70 tuns of gunpowder, 7,000 Enfield rifles, 10 rifled cannon, 60,000 pairs of shoes, a large quantity of blankets and clothing, and an extraordinary amount of quinine and morphine. Remonstrances against her sailing, and indeed against her completing her cargo, were made by Mr. Adams, in London, but the British Foreign Office would not see its obligation to arrest the unlawful voyage. It is reported that the secessionists, at the time the *Bermuda* appeared, commenced firing at some distance from our blockading vessels, and thus succeeded in attracting them away from the blockading ground. The *Bermuda*, in the mean time, slipped into the harbor.

Three new laboratories, on the site of the one blown up, are nearly complete at the Washington Navy Yard, and foundations for the fourth have been laid.

The government calls upon the loyal women of America to knit stockings for our brave soldiers. The following rules are laid down for the direction of ladies wishing to knit socks for the soldiers:—Get large needles and a coarse yarn ; cast on seventy-eight stitches, and knit the leg ten inches before setting the heel. The heel should be three and a half inches long, and knit of double yarn, one fine and one coarse, for extra strength. The foot should be eleven or twelve inches long.

The opinion obtains very widely in military circles that there will be no battle at Washington. The forces of the government are rapidly acquiring proficiency in drill, and when the crisis comes they will not be found wanting in all the essentials of good soldiers.

The people of New Orleans are terribly afraid that their city may fall into the hands of the Federal forces. The *Picayune* asks the city authorities to put every vessel in the harbor into commission, and extend the chain of forts to the Balize, and says the taking of Washington or the occupation of Maryland is of no consequence compared with the loss of New Orleans and the security of cotton and tobacco. The Governor of the State has forbidden the shipments of cotton to New Orleans.

Our troops are suffering severely in the mountains of Western Virginia. A terrible storm prevailed on the 26th ult., during the prevalence of which hundreds of our troops fell to the ground exhausted, and several horses perished. We, who comfortably lodge at home, should not forget the wants of the brave soldiers. They must be well cared for in every respect.

At the time of the destruction of the Norfolk Navy Yard the splended steam frigate *Merrimac*, then very nearly completed, was scuttled and sunk. It is understood that this vessel has been successfully raised, and that the enemy intend to attempt to run the blockade with her from Norfolk. She has been coated with three-inch iron plate, and has an armament of eight rifled guns of heavy caliber. It is reported that her engine has been placed in working order, and that she is now nearly ready for trial.

France acknowledges the blockade of the southern ports. Bouchet, the French Minister of Commerce, says distinctly that the right of blockade exists as a belligerent right, and that it is binding the moment it is effectually established. When it is made dangerous to enter a port the blockade is considered effective.

Permission has been granted to William F. Martin (rebel), who acted as Colonel in command at Hatteras, when the fleet bombarded the forts, to furnish winter clothing for the prisoners, with funds to be received from North Carolina. Martin and his associates are now confined in Fort Columbus, New York harbor.

A very curious calculation has been made relative to the Union troops on the banks of the Potomac. Taking as a basis the regular allowance of room that is required for a soldier to stand upright, and with his musket at "shoulder arms," and placing them in close single file, it would require the whole roadway from Jersey City to the capital to form the line. If the same troops had to be reviewed, it would take a railway train going at the rate of sixteen miles an hour, over fourteen hours, to pass along the line of soldiers.

The loyalty of the German people is fully attested by the war. Statistics show that 60,000 are now in the army.

Gen. Rosecrans, who is in command of a division of the Federal army in Western Virginia, is a graduate of West Point, and at one time practiced the profession of Solicitor of Patents and Civil Engineer. Capt. Scheft, late Examiner in the Patent Office, has been appointed a Brigadier General, and is assigned to Kentucky. The Captain is a veteran campaigner, and has fought in several battles. Capt. Toll, late Examiner in the Patent Office, is now raising a regiment of volunteers. The Captain served with distinction in the Mexican war. Dr. Antisell, Chief Examiner in charge of the Chemical Department, is appointed Brigade Surgeon. He is an accomplished man, and will be missed from his former position.

From Western Virginia we learn that Gen. Reynolds had made two reconnoissances against Gen. Lee, and had driven him from Big Spring, the former rendezvous of his main force. Part of his force are now at Elk Mountain and Green Brier Bridge, and part of it, under Gen. Lee, are said to have joined Floyd at Big Spring. They destroyed their camp equipage and ammunition, and burned several hundred muskets, and left their wagons, &c. The road is absolutely impassable for wagons beyond a point of twelve miles of Elk Water.

Advices from Kanawha say that Gen. Rosecrans is at Mountain Cave, a strong position twenty-five miles beyond Gauley. He had advanced ten miles further to Little Sewell, but the enemy was too well entrenched and too strong at Big Sewell, five miles further on, to be attacked, and Gen. Rosecrans fell back as an invitation to come out and have a fair fight. There is no expectation that the enemy will attempt

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to force the position of Gen. Rosecrans. The weather in the Gauley River Region is terribly bad. Rain falls almost incessantly.

The big Union gun at Fortress Monroe, a shot from which is equal to the combined kick of 33,000 horses, is now mounted so as to sweep the waters between the Fortress and Sewall's Point.

Gen. Wool and Quartermaster Tallmadge have recommended to the Quartermaster-General the quartering of troops at Old Point and Newport News for the winter, in comfortable wooden houses, so as to accommodate two or three companies each. This plan will doubtless be adopted, and it will be another good job for contractors.

Recent advices from the south report that the blockading squadron have dug a passage through the mud of one of the five mouths of the Mississippi to the land which commands the whole five of them, and under protection of the guns of the *Vincennes*, *Water Witch*, and other vessels of the squadron, are erecting batteries which will command all the passes of the Mississippi to the ocean more effectually than it could be done by twenty war vessels. The batteries are by this time complete.

The State of Pennsylvania has now furnished her quota of troops for the war under the proclamation of the President calling for 500,000 men. All honor to this noble commonwealth.

A powerful fleet of war vessels is now at anchor in New York harbor. The fleet consists of the steam frigate *Wabash*, steam sloops-of-war *James Adger*, *Augusta*, *Florida*, *Alabama*, *Curlew*, *Pettit*, *Mercury;* gunboats, *Ottowa*, *Unadilla;* and steam transports, *Baltic*, *Atlantic*, *Ocean Queen*, *Parkersburg*, *Roanoke* and *Coatzacoalcos*. Beside these there are two French and one Brazilian war vessels.

There are now stored in the arsenal at Harrisburg, Pa., 12,000 stand of arms, 43 brass six-pounders, 1 brass eighteen-pounder, 4 brass six-pounders, brought to this country by Lafayette as a present from the King of France to the Continental Congress; also, 600 horse pistols, 600 cavalry sabers, 10,000 sets complete infantry accouterments, and 750,000 rounds of cartridges.

The soldiers in Gov. Banks's army having lately found the nights rather cold wisely adopted the old-fashioned shanty style of fireplace and chimney, formed of turf and clay, with a headless barrel surmounting the outlet of each.

According to the best accounts we can gather the secession army on the Potomac numbered about 150,000 on the 1st of October.

The army at Washington now under Gen. M'Clellan's exclusive command, is said by George Wilkes, of the *Spirit of the Times*, to number 240,000 men.

The Norfolk (Va.,) *Day Book*, of the 12th inst., states that Billy Wilson's Zouaves, stationed at Santa Rosa Island, were attacked by surprise, on the 8th inst., by a superior force. The account, strange to say, does not claim a brilliant victory. It asserts that the fighting was desperate on both sides, that Billy's guns were spiked and his equipment destroyed. The spiking of the guns is not believed, as it is said that Billy had no artillery. All such reports must be received with a proper degree of credulity.

Brigadier General Robert Anderson, who so nobly stood by his country's flag in Fort Sumter, and more recently in command of the United States forces in Kentucky, has been obliged to give up active service in consequence of failing health. The withdrawal of Gen. Anderson is deeply to be regretted, as he possesses the confidence of the government and the people in an eminent degree. He is one of God's best creations. Gen. Sherman, an efficient officer, is appointed to relieve Gen. Anderson in his command.

Gen. Lane, at Osceolo, Mo., took all the supplies intended for Price and Rains and $100,000 in money. The supply train was nearly three miles in length. This is the most important success gained for the Union cause in Missouri, and goes far to redeem our losses at Lexington.

A GENTLEMAN, who has lately been among our troops on the Upper Potomac, where the "ague" is quite prevalent, says that an extract of the common white plantain, made by steeping the leaves in whisky, and taken before breakfast, a dozen mornings in succession, is even more certain than quinine in curing the fever.

THE AMERICAN CONFLICT---FALSE ACCUSATIONS.

A correspondent of *Mitchell's Steam Shipping Journal* (English), presents to the British public the following summary of affairs here: "The better sense of our people is silenced by the uproar of the rabble. The press is made to dictate to the President, to rule Congress, and to command the army. The reign of terror is *all but* supreme. Editors are tarred and feathered if they differ from the ravings of the demagogue. The proprietor of a newspaper that asks the government to pause and reflect is thrown into prison as a traitor. Every politician thinks himself as nice and good as the President. They are all masters and no servants. Republicanism is fast assuming one of the worst forms of despotism the world ever saw, and fears that unless some friendly power intervenes despotism alone can relieve us from our troubles," and asserts that thousands in the north would hail the friendly interference of France and England as a great relief. In other words, to acknowledge the independence of the Confederate States, and put a stop to "the miseries of despotism and stay the ravages of civil war."

It would be useless to argue with this vagabond correspondent, who is undoubtedly a paid tool of Jefferson Davis, but we desire to say a few words to our cotemporary, the editor of *Mitchell's Shipping Journal*. The writer of the letter in your issue of the 20th ult., is endeavoring to deceive the British public through your columns. He is evidently well versed in the practical workings of the rebellion, and if his assertions had been applied to the rebellious States instead of the loyal States they would have been singularly pertinent and appropriate. Unfortunately, he has placed the saddle on the horse instead of on the ass, and is trying to shift the crimes and the violence which has marked the progress of secession, upon the government of the United States and its loyal supporters. There is scarcely a word of truth in this whole extract. The practice of tarring and feathering is wholly unknown in this latitude. It is a barbarous custom, like duelling, known only in the so-called Confederate States. The reign of mob terror is not only *all but supreme*, but it is wholly so in the seceded States, and is wholly unknown in the loyal States. No one who values his honor as worth a rusty copper, will dare to deny this fact. One other point deserves notice. The writer urges upon England and France, as an act of humanity, to recognize the Southern Confederacy, "and thus save a free people from the miseries of despotism, and stay the ravages of civil war and all its horrors." We sincerely believe, judging from the temper of loyal citizens, that no other act could so thoroughly arouse their determination to triumph over this rebellion. It would thoroughly exasperate and consolidate the loyal people, and instead of 300,000 men there would be 1,000,000 in arms before the first of January, pouring down upon the southern plains like an avalanche. The best way for England and France is to let this matter alone. If, however, they are getting anxious to put a stop to the war for the purpose of securing further supplies of the great staple, let them encourage the government in its efforts to suppress the rebellion.

We have taken occasion to reprobate the conduct of certain English journals in reference to our troubles. Their right to discuss them in all their length and breadth we do not question, but we have a right at least to claim that in so doing they stick to the truth, and not make our affairs any worse than they really are. The loyal people claim that it is no crime to uphold a good government, and they are determined to do it at all hazards.

A Novel Breastwork.

A correspondent of the Chicago *Times*, describing the siege of Lexington, thus describes Gen. Price's hemp breastworks:—"At this juncture our men discovered with no little dismay an engine of war which was being brought to bear on them, threatening the consequences which they dreaded most—a safe approach for the enemy, and an ultimate charge in force over the intrenchments. The rebels presented a strong breastwork of hemp bales, which appeared like a moving barrier, impenetrable to bullets or cannon shot, and swarming with men in the rear. It was about twenty rods in length, and the hight of two bales of hemp. The bales were placed with the ends facing our fortifications, affording a thickness of about six feet. This immense breastwork commenced moving forward, not by detachments or singly, but in one vast body, unbroken and steady, as though it slid along the ground of its own volition. It advanced steadily over the smooth surface, parting to pass trees and closing up again as impenetrable as a rock. Behind it were hundreds of men pushing and urging with levers, while others held the bales steadily to their places, and others still, whose numbers seemed almost infinite, firing between the crevices and over the top at our soldiers. Our men looked at the moving monster with astonishment. It lay like a large serpent, winding over the hills and hollows, apparently motionless, yet moving broadside on, to envelop and destroy them in its vast folds. In vain the cannon were turned upon it. The heavy bales absorbed the shot harmlessly, or quietly resumed the positions from which they were displaced, seemingly moving without hands, but in reality controlled by strong arms which were unseen. In vain the musket bullets rained upon it in unremitting showers. The thousands that it concealed were safe from such puny assaults, and, slowly gliding along, they waited with eargerness the time when their position should warrant them in bursting through its walls and storming up to the intrenchments. Our brave soldiers could only watch it with keen anxiety, and wait for the fearful result."

Gen. McClellan's War Horse, "Handsome Dan."

We find in *Porter's Spirit of the Times* the following description of this celebrated horse, formerly owned by H. C. Creveling, of St. Louis, and presented to Gen. McClellan by several gentlemen of Cincinnati—reported to be worth over one thousand dollars. He is a gelding, of a beautifully-dappled mahogany-bay color, with three white feet and a star, very heavy flowing black mane and tail—the latter a regular "spout." He is sixteen hands high, and weighs, in ordinary flesh, 1,260 lbs. He was sired by Gen. Jackson, dam of Sir Archy and Messenger. He has a fine, bony, intelligent head, delicately-tapered ear, and a proud, beautifully-arched neck, capital shoulders, very long and muscular hams, whose symmetry could not be improved were they carved to order; his chest is broad and deep, his legs fine, flat, and bony, with his hocks and knees well down to his heels, and his fetlocks almost to the ground, with a round, well-ribbed "barrel" of tremendous length, and loins and hips remarkable for strength and beauty. Indeed, his fine points and evenly-balanced proportions make him, in the fullest sense of the term, a *model horse*, not only for symmetry, but for speed and stoutness. As a field horse he has no superior, being very "topy" when in action, with a proud and nervous step, his head as high as his rider's when mounted, and his throat-latch and tips of his fore feet almost on a perpendicular line when in repose.

He possesses many singular characteristics common to no other one of his species. For instance, he will not stamp his feet to shake off a fly if there were a thousand on him, seeming to entertain a feeling of contempt for all lesser animals; and his confidence in, and affection for, the human species is such that he will not, under any circumstances, suffer his attention to be distracted from his master by any minor object. To his own species he pays no attention, passing among them without deigning them the slightest notice, not even when turned loose in the same yard or field. He will follow his master up any flight of stairs, or along any precipice where he can get a foothold, relying on his master's judgment for his safety; he will stand anywhere he is left without constraint, and is as brave as a lion, and as discreet as a judge.

In speaking of this horse, Willis says, "he is afraid of nothing." The proof of it was in the fact that (beside all the cannonading and trumpeting) he stood for a half hour, during the latter part of the review, with the large and showy flag, which indicated the commanding officer's position on the field, flaring directly across his eyes and touching his muzzle at every puff of the wind, without flinching an inch. Every other horse, cavalry and artillery, shied in passing this showy object. The immovableness of McClellan's horse, standing nearest to it, was remarked by all around me. I venture to promise (after considreable study of him), that the honest and brave chestnut sorrel, as long as he has life in him, on the battle field, will do well by his rider.

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THE POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The regular weekly meeting of the Association was held at their room at the Cooper Institute, on Thursday evening, Oct. 10, 1861. The President, Professor Mason, in the chair.

DOCKS AND PIERS.

Mr. DIBBEN read a long paper principally relating to the docks and piers of New York city, dwelling upon their cheap construction of wood, the faulty plans upon which they are arranged, and their mean and dirty appearance. He contended that the sewers and gutters ought not to discharge into the basins but should be carried out to the end of the piers.

Prefessor MASON—Do you know how many sewers are not carried to the ends of the piers?

Mr. DIBBEN—I do not know the exact number.

Professor MASON—They are nearly all carried out.

Mr. DIBBEN—I contend that the gutters ought not to discharge into the basins any more than the sewers. The reason why we do not have better docks is that the matter is in the hands of the City Council and the members do not understand the matter. It ought to be placed under the control of a permanent board of competent engineers. The Liverpool docks are completely inclosed, and vessels enter and depart from them by gates. This is rendered necessary by the great rise and fall of the tide—some 18 feet. We do not need this arrangement, but our wharves should be built of stone, and kept clean, so as to be an honor instead of a disgrace to the city.

Mr. NASH—The principal difficulties in the way of improving our docks are of a legal character. The charter of the city, which was granted under the authority of the British government in colonial times, does expressly say, in so many words, that the boundaries of the city shall be low water mark on the Long Island shore and on the New Jersey shore, giving to New York all the lands lying under the North and East rivers. But when the city attempts to assert this right in the courts, it is met by the plea that navigable waters are public highways, and we are told that if we are not pretty civil, our charter will be taken away from us by the Legislature. It was held in the famous Dartmouth College case, that though a State Legislature has no authority to disturb the privileges of private corporations, it has perfect control over the charters of municipal corporations.

Mr. ROSEVELT—The only reason why New York does not preserve all the rights belonging to her under her charter is, that she does not insist upon them. The learned gentleman may remember that in the case to which he has referred, Judge Story remarked that charters derived from foreign powers and recognized by treaty, could not be disturbed.

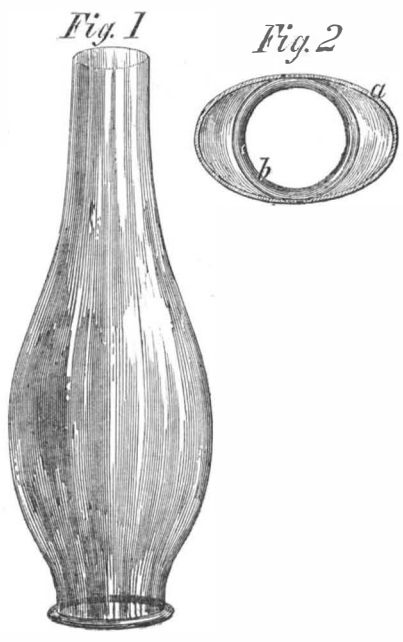
Professor MASON—I am not a lawyer, but I will remind the two legal gentlemen, that, in the Charleston-river Bridge case, Judge Story decided expressly that a State Legislature had absolute power over charters, whether derived from itself or from foreign governments. That decision was made on the argument of Mr. Taney, at present Chief Justice of the U. S. Supreme Court, and it carried with it three-quarters of the court. By it the whole claim of the inviolability of foreign charters was completely brushed away.

Mr. TILLMAN—These law arguments are out of place in this society. The question for us is the defects in our docks and piers and the way they may be improved. New York has the most extensive and convenient dock room of any city in the world. We have about thirty miles of wharf frontage, measuring along the sides and ends of the piers. There are some evils connected with the docks that ought to be remedied, especially the accumulation in the basins of offensive matter from the gutters. These reforms will doubtless be effected in proper season. Heretofore our wharfs have necessarily been of a temporary character from the constant growth of the city outward into the water. If we had constructed costly docks, they would have soon become useless and would have been buried beneath the advancing streets. But the city has now been extended about as far out as the width of the rivers will permit, and it is about time for us to begin to build more permanent wharves. One plan that has been suggested for preventing the basins from filling up is to construct the wharves of narrow piers of masonry, between which the tide might flow back and forth to wash out the basins; a roadway, like a bridge, being supported upon the tops of the piers.

Professor MASON—I wish to make one statement in relation to our docks that has not been made in this discussion. The city of Boston has probably the best wharves on this continent. They are built of large blocks of granite. They are owned by private corporations or individuals, and pay an interest to their owners from wharfage collected from the vessels which lie at them to receive or discharge their cargoes. After visiting Boston and returning to New York, I was curious to know why there was so great a contrast in the character of the wharves of the two cities. I found that nearly all of our wharves belong to the city, that they are under the management of a commission, and though estimated at a value of $5,000,000, they pay a mere trifle of revenue to the city government. I hunted up the commissioners and asked them what this meant. They told me that the wharves of New York belong to the city, and that it is the policy of the commissioners, in administering their great trust to make the charges to vessels visiting the port as light as possible. They therefore keep the wharves in repair as cheaply as they can. The result is a charge to vessels for wharfage in New York of one half the rates exacted in Boston, and this is no small inducement for vessels to give our port the preference. Said the commissioner to me, "Would you like to see a turnpike gate in Broadway to levy a tax on all passengers along that thoroughfare for the benefit of the city? A high wharfage on vessels would not be less disadvantageous to the commerce of the place."

DETHRIDGE'S OVAL LAMP CHIMNEY.

When a round chimney to a lamp is placed over a flattened flame, the edges of the flame, of course, come much nearer to the glass than the sides do. Two evils result from this:—1st. The thick column



of air which passes up by the side of the flame is imperfectly heated and, consequently, does not enter into combustion with the carbon, which, therefore, passes off unburned in the form of smoke. 2d. The unequal heating of the chimney frequently causes it to crack. These difficulties are overcome in the simplest manner by the improvement here illustrated. This improvement consists of an oval hub, *a*, Fig. 2, adapted to a round base, *b*, by which two advantages are secured. 1st. The draft is made stronger and more regular by bringing the chimney everywhere equally distant from the flame, thus producing a more perfect combustion and less liability to smoke. 2d. There is less danger of breaking the chimney by sudden expansion, for the heat of the flame being received with an equal degree of force upon all parts of the glass, the expansion is much more regular than in the round chimney. The immense demand for lamp chimneys since the use of coal oil has become so extensive, renders ever so small an improvement in their manufacture vastly important.

The patent for this invention was granted Oct. 8, 1861 (see claims on another page), and further information in relation to it may be obtained by addressing the inventors, E. and E. D. Dethridge at the Fort Pitt Glass Works, Pittsburgh, Pa.

PROF. CALVERT ON ENGLISH OAK AND WOOD USED FOR SHIPBUILDING.

At the late meeting of the British Association for the Advancement of Science, Dr. Crace Calvert, F.R.S.—the distinguished chemist—stated that he had recently made investigations into the qualities of several woods to ascertain which was the best for shipbuilding purposes. "If English oak," he said, "has hitherto stood so high, it must have been owing to our ignorance of the valuable properties of some of the woods grown in tropical climates, in which the soluble and highly decomposable tannin of oak is replaced in some instances by resins, and in others by substances similar to caoutchouc. This is the case with Mulmein teak, Mora wood, Santa Maria and Honduras mahogany, which give them great advantages over oak when used for shipbuilding."

The liability of different woods to dry rot were arranged by Dr. Calvert, as follows:—Unseasoned oak, rapid; seasoned, moderately rapid; African teak and Honduras mahogany, limited; Mora wood, Santa Maria and Mulmein teak, none.

It was also observed by Dr. Calvert that oak which was felled in summer contained but little tannin and a great deal of gallic acid, while that felled in winter was rich in tannin and contained very little gallic acid. In a report made by Mr. James Jarvis, of Portsmouth, Va., in 1855, to the Bureau of Construction of the American navy, he stated that winter (according to his experience) was the best season to fell oak intended for shipbuilding. This experience agrees with chemical science, because timber containing gallic acid is more liable to rapid decay than that containing tannin.

As all iron-plated ships are built with a backing of thick timber planking placed in contact with the metal, oak containing much gallic acid is not suitable for this purpose, because this acid attacks iron with avidity. All those who have any share in the construction of iron-plated war vessels should know this. Seasoned oak contains about twelve per cent of soluble matter, unseasoned about twenty-four per cent. This is easily convertible into gallic acid by moisture and exposure to the atmosphere. Resinous woods should always be preferred to those containing tannin and albumen, to be used in contact with iron, unless they are kept perfectly dry, in which case one is just about as good as the other.

How to have Good Cider.

A correspondent of the Boston *Journal* says:—"Put the new cider in clean casks or barrels, and allow it to ferment from one to three weeks, according as the weather is cool or warm. When it has attained to lively fermentation, add to each gallon three-fourths of a pound of white sugar, and let the whole ferment again until it possesses nearly the brisk pleasant taste which it is desirable should be permanent. Pour out a quart of the cider, and mix with it one quarter of an ounce of sulphite of lime for every gallon the cask contains. Stir until it is intimately mixed, and pour the emulsion into the liquid. Agitate the contents of the cask thoroughly for a few minutes, then let it rest that the cider may settle. Fermentation will be arrested at once, and will not be resumed. It may be bottled in the course of a few weeks, or it may be allowed to remain in the cask and used on draught. If bottled it will become a sparkling cider, better than what is called champagne wine. Professor Horsford, of Cambridge, was the first to use the sulphite of lime for this purpose, and to him is due the credit of first calling attention to its usefulness. It is in no respect deleterious, as the sulphite, into which the sulphate is changed by the liberation of sulphurous acid, is entirely insoluble, and remains at the bottom of the vessel. The writer has cider prepared in this way two years since, which has remained unchanged, and is now a beverage of unsurpassed excellence. The sul*phite* of lime, not the sul*phates*, must be used."

[The above-described plan for preventing the fermentation of cider, we have no doubt, is a good one; but the reactions described by our cotemporary are not such as actually occur. It is not the sulphate that is converted into the sulphite, but the reverse.—EDS.

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THE NEW MODE OF LOCOMOTION.

It would be a great step in the direction of safe and economical locomotion if men and women could be induced to trust themselves in a train *inside* of a pneumatic tube. "Tube, indeed! what next?" demands an indignant reader. "Perhaps you would have us shot off from Whitworth guns, or explode us under the receiver of an air pump, or steam us in a kettle!" "I have heard," interrupts another, "of escaping slaves being boxed up as goods and packed off by railway or steamboat, the box being occasionally placed on the wrong end by way of variety. Being packed in a tube, like a cartridge in a rifle, might prove, perhaps, an equally agreeable mode of traveling!" No, no, nothing of the kind; and the man who trusts himself to the impulse of the atmosphere in its effort to regain its equilibrium in a closed tube, need not fall a martyr to science, nor need he even send through his mother-in-law by way of experiment, to become the subject of interrogation or an inquest at the distant end of the thoroughfare. George Medhurst proposed the plan, sixty years ago, and we may live to see it carried out. Mr. Loftus Perkins, grandson of the late Jacop Perkins, and still engaged in perfecting the inventions of that ingenious man, endeavoured, when last in the United States, to carry out a scheme of pneumatic communication between Boston and New York, the distance of 236 miles to be made in an almost incredibly short space of time—say in half an hour! Mr. Perkins offered to be the first through passenger, taking with him, we might be inclined to suppose, a small quantity of respirable air in an acordeon, a portmanteau, or a two-gallon jar. In explanation of the enormous rate of speed we may observe that air, under the ordinary pressure of the atmosphere, rushes into a vacuum at the rate of nearly 1,000 feet per second, or at about one-half the velocity of steam of the same pressure. A velocity of 1,000 feet per second is a speed of 681.8 or nearly 700 miles an hour, a rate of traveling somewhat beyond the ordinary experience of even this fast age. There is, too, no ground whatever for fear in a flight through such a tube; the carriages could not run off the line, and it would be impossible to work them in such a manner that two trains could proceed, at the same time, in opposite directions in the same tube, and very difficult, if not impracticable, to run two trains, the one after the other, during one exhaustion of the tube. If the wheels or axles of the carriages should break, or if a rail should snap in two, there need be no further damage, as provision could easily be made against the broken parts becoming wedged, and the carriages would then only rub along, in a confined passage, until they stopped. "Ah, yes, but how about suffocation?" There could hardly be such a thing—and unless the "leakage" or "windage" between the carriages and the tube was very slight indeed there would, on the contary, be more air than would be wanted. It would be a question of keeping out draughts from the carriages rather than of preventing the stagnation of that already in them. We have old ladies going down in the diving bell at the Polytechnic, young ladies going up in balloons, mild gentlemen descending the Dukinfield coal pit to experience an additional 30° of the earth's central heat, and, wherever there is a lofty chimney in progress, hundreds are glad to be drawn up it to the top, an excursion which, at one time, was amazingly popular at St. Rollox, Glasgow, and, afterward, at Port Dundas in the same "burgh." Why, then, should one fear to be whisked through an atmospheric tube? Beside, the thing has been done. The "Pneumatic Post" in Battersea-fields has actually become a thoroughfare for passengers. Through a tube rather more than a quarter of a mile long, and only equal in area to a 33-inch water main, trucks are run in which, after bags, ballast and dogs had been first sent through at a speed of about 25 miles an hour, an adventurous navvy booked his passage. He came out in a good state of preservation, and appeared disposed to recommend the route to the patronage of the traveling public. Since then, the 24th of July last, a large number of men have passed through the tube, and they agree in describing their journey as smooth and comfortable, the interior being agreeably cool, with no want of fresh air. With a 7-foot tube, the passage might be made luxuriously, and at any speed desired, 30, 60, 100, or 200 miles an hour. It is questionable whether the dislike to such a mode of traveling would be greater than that originally entertained towards railways. Railway tunnels, too, at one time were the especial bugbears of nervous people. On account of the occurrence of accidents in them they may be so still, but in the atmospheric tube, collisions, as we have said, could not possibly occur, and are not therefore, to be dreaded. The original apprehension as to the danger of riding in railway tunnels was that the passengers would be suffocated, like the two unfortunate men, last week, in the Blisworth tunnel of the Grand Junction Canal. Dr. Lardner was a stout opponent of the Great Western Railway, and we believe he made a strong point as to the Box tunnel. Eminent medical authority had to be called in to show that the danger of suffocation would be very slight indeed, else, perhaps, the bill would not have passed. Setting aside the apprehension as to collisions, few people, probably, have any particular dislike now to a subterranean journey under Box hill, or at Kilsby, Standedge, Woodhead, or even at Clayton. The Metropolitan Railway Company expect their underground line to become popular, and a tunnel 6½ miles long is being made under Mont Cenis, and one of 4½ miles through the Hoosick Mountain in the United States, both without shafts, and both, if they are ever finished, expected to become ordinary routes of travel. There are 75 miles of railway tunnels in the kingdom, through the whole of which many millions of passengers are carried yearly.—London *Engineer*.

THE RUSSO-AMERICAN TELEGRAPH QUESTION.

The Russian government seems determined to be more and more intimate and friendly, commercially and politically, with the United States. They have an agent in this country, at present, investigating the mode in which Americans construct telegraph lines through the western wildernesses, with a view of constructing one from the government of Omsk, in Siberia, via the Amoor river and Behring's Straits, to Russian America, and thence southward toward San Francisco. This agent is Colonel Romanoff, of the Russian army, who holds the high position of Superintendent of Telegraphs in Siberia, and who is probably a relative of the imperial family. On the 11th instant he had an appointment to meet in the Chamber of Commerce any parties interested in the establishment of telegraphic communication between Russia and the United States. The hour was twelve o'clock, and shortly after Colonel Romanoff entered the Chamber, where several gentlemen were awaiting his arrival and examining a map of the proposed line from Moscow to St. Petersburg, which was laid before them by Mr. Collins, the American mercantile agent on the Amoor river. The Colonel was introduced by Mr. Collins, and it became evident at once that he was a gentleman of refined manners. He is about five feet ten inches in hight, rather slightly built, and with an easy, graceful demeanor and military carriage. His complexion is light, his head slightly bald; he wears a moustache and whiskers, seems to be about thirty or thirty-five years old. The Colonel's countenance is rather Teutonic, especially the forehead, which is broad and intellectual, and, like his hands, as fine and fair as any lady might desire to have her own. His nose is of the Roman type, his visage pale and face oval, and his eyes are blue, of medium size and quickness. The most peculiar and winning feature in Colonel Romanoff's appearance is the peculiar mildness of his countenance, and the no less pleasing suavity of his manner. Mr. Collins stated his views of a Russo-American telegraph, as they were submitted to Congress at the last session. Colonel Romanoff conversed in French, sometimes, however, explaining his ideas in broken English. He said that in 1858 an imperial ukase had been issued at St. Petersburg to extend telegraphic communication eastward from Moscow through Siberia, and that the ukase has so far been carried out that the telegraph is now in operation as far as the government of Omsk and city of Omsk, in Siberia, on the confines of eastern and western Siberia, a distance of 2,500 miles from Moscow and 3,000 from St. Petersburg. From Omsk, a city of about 40,000 inhabitants and of considerable trade, on the borders of western Siberia, it is the intention of the government, in accordance with the ukase, to continue the telegraphic communication to the Amoor river, and thence along the Amoor river to the Pacific Ocean, and this would bring it within 5,000 miles of San Francisco. Colone-Romanoff has orders to extend the line from the government of Chetah, on the Pacific, opposite the Japanese island of Hakodadi, up the Amoor river to Vlal denostock, at the confluence of the Ousaree and Amoor rivers, where his line will meet the line which will by that time be extended from Omsk to the same place along the banks of the Amoor. From the mouth of the Amoor, at the Pacific, Mr. Collins advocates that the line should be extended along the shores of Siberia and Behring's Straits, but Colonel Romanoff favors the route via the Aleutian Archipelago to Russian America, whence the line would be continued to Vancouver's Island, and thence to San Francisco, where it would connect with our line to the Pacific, and bring New York into communication with Moscow and London. Colonel Romanoff believes that the cost would not exceed that of the Atlantic telegraph which was lost, and suggests that an expedition of two or three vessels be fitted out by the two governments of Russia and America, to explore the regions through which it is to pass, and investigate the land routes. The greatest distance from land to land in the Aleutian Archipelago is 175 miles, and the greatest via Behring's Straits is 8 miles. The latter route, however, is much more circuitous than the other. The Colonel stated that with the permission of the Russian government the route to Omsk and thence by stages to Pekin is already used by the British and French governments and that London is only thirty days from Pekin in this way, and that it will only be fourteen days distant next year, when the line will be completed to the mouth of the Amoor. He urged that the advantages of extending the line to San Francisco would be inestimable. In fact, Colonel Romanoff spared no pains in explaining the nature of his ideas, and received the thanks and admiration of all his auditors when he was leaving the Chamber. He will remain in this country two months, for the purpose of investigation, and then return to St. Petersburg.—*Herald*.

Silvering Glass and Porcelain.

Mr. E. R. H. Unger, in a letter to the editor of the *Chemical News*, states:—"In making various experiments the other day with nitrate of silver, I happened to add to a small quantity of a strong solution of that compound an equally small quantity of a thick alcoholic solution of tannin. The quantity, though small, was exposed with a comparatively large surface to the atmosphere, by making use of a flat-bottomed evaporating dish.

"About a half an hour afterward I happened to direct my attention to this dish, and found to my great surprise that the surface in the dish was coated with a thin, brilliant, uniform layer of metallic silver. I directly repeated the experiment, and met with the same result again and again. I next proceeded to evaporate the liquid to dryness by placing the dish on the surface of warm sand. As soon as it was completely dry, the coating was found to be so fast on the porcelain that it required the point of a sharp penknife to scrape it off.

"From these experiments I would venture to conclude that porcelain, and any other stony and smooth surface, might be plated with silver, and if so, it might be useful in many of the arts. I would add in conclusion, that I also succeeded in producing a metallic brilliant coating from a saturated solution of sulphate of copper by the same solution of tannin."

SALT TO SAVE MANURE.—Dissolve common salt in water, sprinkle the same over your manure heap, and the volatile parts of the ammonia will become fixed salts, from their having united with the muriatic acid of the common salt, and the soda thus liberated from the salt will quickly absorb carbonic acid, forming carbonate of soda; thus you will retain with your manure the ammonia that would otherwise fly away, and you have also a new and most important agent introduced, viz., the carbonate of soda, which is a powerful solvent of all vegetable fiber.—*Gardener's Chronicle*.

As an improvement upon the barbarous word "telegram," the more expressive one of "tell-a-whopper," has been suggested. The hint will certainly be adopted if the reporters persist in sending their purely fictitious messages over the wires.

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Correspondence

Fleury's Improvements in Treating Iron.

Messrs. Editors :—Every design which has for its object a tendency to cheapen or improve the manufacture of iron, is a matter of interest, to the whole population of this great Republic, and the person who, after perhaps years of study, succeeds in developing a plan or plans to effect this great desideratum, is worthy the thanks at least of our people for the effort and accomplishment of the undertaking. The callings of my profession bring me often in connection with patentees or discoverers of chemical processes—considered improvements—in the reduction of minerals and manipulation of metals. My attention, however, has been more particularly and frequently directed to objects affecting favorably the smelting of iron and to manufacturing the metal than to other works of this kind, it being most assuredly the sinews of strength of this nation. Iron is a mightier monarch than cotton, or any other material. If "cotton is king" of the South, iron is king of East, West, North and South? What kind of nation would we be without iron? It is the keystone of the arch of strength of the Keystone State. It gives much wealth to New Jersey and other States.

During the present year I have watched the doings of Prof. Anthony L. Fleury, who has been investigating and experimenting on the influence of electricity on metals. Bridgton, N. J., was for some time the seat of his operations, and there, with the assistance of a practical iron manufacturer from England, he succeeded in discovering that Prof. Farady's surmises were correct. "It is not improbable," says the learned Professor, "that there may be other bodies beside charcoal capable of giving iron the properties of steel." Mr. Fleury did purify and convert cast iron into an excellent quality of wrought iron at a very cheap rate, and he found that he could produce good puddled as well as other steel by a slight variation of the process, and he says that he is satisfied he can manufacture wrought iron and steel directly from the ore. He subjects the metal or ore while in a molten or boiling state to the simultaneous action of a current or currents of electricity and of nitrogenized hydrogen, or of nitrogenous salts, or nitrogen containing substances which are introduced in liquid, solid or gaseous form, among the boiling iron, by means of a hollow tool, for which processes he has secured Letters Patent.

The editor of the London *Mining Journal*, in reference to this thing, says that Mr. Fleury claims no new theory, "but simply the economic application of discoveries which have already been proved to be effective, but which, upon the original introduction, could only be availed of at a cost which rendered them for all practical purposes, valueless," and the editor goes on and says:—"It was for Professor Fleury to discover how this action [electrical] could be produced continually, cheaply and simply, and he certainly has succeeded completely."

The value of Professor Fleury's application of ammonia compounds to molten iron, has been confirmed by a celebrated chemist, Fremy, in his late communication to the Academy of Sciences in Paris.

I looked forward, with much anxiety, for something of economic value, to show itself, from the indefatigable exertions maintained for a number of years by Mr. Bessemer to effect a beneficial change in the manufacture of iron, so as to cheapen its production; and also to other persons who have been devoting their time and talent to this great object. Notwithstanding nothing very effective in economizing the production of iron has been done by these gentlemen, their continued discoveries, in various ways, have been stepping stones upward toward perfection. Mr. Fleury's, I think, is the topmost one.

William F. Roberts,
Practical Geologist and Mineralogist.

Mount Surprise, Pa., Sept. 7, 1861.

Coating for Water Pipes.

Messrs. Editors :—In an account of the Constantinople aqueducts, I see the following receipt for a lining cement for water tubes. Possibly it would be too expensive to use in great masses; but if tubes and cisterns lined with it will hold water, in a severe climate like that of Constantinople, for more than a thousand years, it must be very valuable to paint over iron tubes. *Vide* White's "Three Years in Constantinople."

Receipt.—100 lbs. fresh kilned lime, powdered fine; 10 quarts linseed oil; one or two ounces cotton wool. Mix by degrees till the mass becomes like dough, let it dry, and then break into cakes. When wanted for use, pulverize a sufficient quantity, moisten it with linseed oil, and with this paste give one or two coatings, allowing each to dry. Pipes of metal or clay can be joined by twisting well-carded hemp, saturated with this composition, round the joints and making it fast with cord, also dipped in the mixture.

The rubble used in Constantinople, called khorasan, is composed of one-third bricks or tiles, pounded to the consistency of road scrapings, and two-thirds fine sifted lime, with the needful quantity of rain water.

J. S.

Treatment of Wounds.

Messrs. Editors :—Below you have a few items for the benefit of all, especially for mechanics and soldiers :—

First,. When the skin is smoothly cut through with any sharp tool, carefully close the wound immediately by wrapping a suitable cloth around it, and be sure not to wet or disturb it for one week, and if it is not a very severe wound it will be entirely cured. This is termed "healing by first intention."

Second, If the flesh is torn as by a saw or rasp, then be sure to pare off every particle of loose skin and flesh, close the wound by applying a plaster of egg salve made as follows :—beat the yellow of an egg with warm lard until well mixed. If it be a bad wound it will need a careful washing once or twice a day with a very soft rag or sponge, using Castile soap. These wounds need to heal by what is termed "inflammation, suppuration and granulation."

Third, If the skin is but slightly torn, be sure to remove, as in the preceding case, every particle of loose skin, and you need not tie it up, neither will any trouble be experienced from it, especially if a little ear wax (what every person has at hand) is rubbed over it carefully and thoroughly. I have never found any other dressing equal to this.

Fourth, If the finger or toe nail is torn loose from the flesh by a splinter or anything else, pare the nail till the last separated particle is taken off, and it will soon get well if it is tied up so as to keep the dirt and air from it.

Fifth, If the nail is mashed so as to make a blood blister under it, then carefully cut or bore through the nail into the blister, so as to let out the bruised blood, and it will give relief and soon get well.

Sixth, If the nail grows into the flesh, rasp or scrape the nail all over so as to make it as thin as possible and keep it so till the nail grows as long as the toe; having once got the nail on the surface, keep it so by never paring it only even with the end of the toe. While the nail is growing, a wad of cotton or tow may be placed between the toes a little back of the sore part.

Strict observance of the above will give entire satisfaction.

A. W. Todd.

Montgomery, Ala.

Black Drink.

Messrs. Editors :—We are not yet put to the same straits to invent substitutes for tea and coffee, as the secessionists, under an effectual blockade; still, all the information we can glean in reference to the subject cannot fail of being interesting at all times. The peculiar azotized vegetable principles analogous to thein and caffein, are now known to be common to many plants of families widely separated in affinity, and apparently of very opposite properties. Thus, *Chinchonaceæ* yields the coffee tree, *Ternstroemeaceæ* the tea plant, *Byttneriecеæ* the chocolate tree, *Sapindaceæ* the Guavana bread, and *Aquifoliaceæ* the Paraguay tea, all of which are said to possess this principle. From the accounts of the effects of the long-continued use of the Paraguay tea, it would seem to possess a narcotic principle, similar to morphine, which is probably the cause of its deleteriousness. But the Southern Indians who use the Youpon, do it for its medicinal effects in vomiting and cleansing the stomach and not for the purpose of a "big drunk," as is sometimes supposed. The plants of this family in the United States appear to possess only purgative, emetic, diuretic and sudorific qualities, and not the narcotic properties of the Brazilian plant.

J. M. B.

Detroit, Mich., Oct. 9, 1861.

Sand Storms in California.

Messrs. Editors :—Observing in California papers frequent allusions to the sand storms which infest their coasts at certain seasons, and believing that nature was meant to be the servant rather than the master of man, I offer the suggestion that the Horticultural Commission from that State should include in their collection plants and seeds of the *marrum* or sea-mat grass (*Psamma arenarium*), which has proved so effective in binding the once shifting sands of Holland, Norfolk and other countries bordering on the German Ocean—a sea whose climate is so nearly isothermal with that of San Francisco as to make the success of the proposed culture scarely problematical. Nor would the plant be likely to be squeamish on the subject of sea air, or even an occasional dose of salt water itself. When once started it takes care of itself and the sand too.

G. H. Knight.

Cincinnati, Ohio, Oct. 14, 1861.

Strange Prophecies.—In the year 1815, the late Elkanah Watson, as appears in "Men and Times of the Revolution" (page 522, second edition), made and published the following estimate of the probable population of the United States for a long series of years. The actual result, thus far, shows a singular approximation to the calculations. He calculated that the population would be :—

In 1820,	9,626,634—actual result,	9,638,151
In 1830,	12,833,645—actual result,	12,886,020
In 1840,	17,116,526—actual result,	17,050,566
In 1850,	23,266,388—actual result,	23,191,876
In 1860,	31,753,854—actual result,	31,647,859

His calculations for the future are as follows :—

In 1870,	42,328,432	In 1930,	133,000,000
In 1880,	56,450,241	In 1950,	177,000,000
In 1890,	78,055,989	In 1970,	236,000,000
In 1900,	100,355,802	In 2000,	283,000,000

Whaling News.

Up to the 7th inst. the importations of sperm and whale oil and whalebone into the United States this year were as follows :—

	Sperm Oil. Bbls.	*Whale Oil.* Bbls.	*Whalebone.* Lbs.
1861	58,651	122,045	912,700
1860	62,278	132,984	1,072,500

On the 11th inst. the ships *Syren Queen* and *Northern Light* arrived at New Bedford, Mass., from the place called Rowe's Welcome, Hudson's Bay, about lat. 65 N. and long. 90 W., bringing cheering news of the discovery of a new fishing ground, abounding with whales, in the region of Chesterfield Inlet, about 1,500 miles west of Cumberland Island. This new whale field is not known to have been ever before "improved" by any whalers, European or American. No ships are known to have visited that point since the expedition of Parry and Lyon about forty years ago—1822. Some enterprising oil merchants, reflecting on the statements of those navigators concerning the abundance of whales, fitted out the two ships above mentioned; and the result justifies their enterprise, in proving the truth of Parry's statement that "whale's might be seen every day in the open season."

A Splendid Medal from the Prince of Wales.—Messrs. Gurney & Son, the well known photographic artists of this city, have just received from the Prince of Wales a splendid gold medal, weighing 4 ounces, as a testimonial to their skill in the execution of a number of photographs of His Royal Highness and suite during their visit to this country in 1860. The obverse side of the medal has a fine medallion likeness of the Prince. The reverse is ornamented with his coat of arms. It is a valuable testimonial, and most worthily bestowed.

A table has been ingeniously constructed by Wm. Pollard, of 306 pieces of the famous Charter Oak, and is shown in a store window at Hartford, Conn. The wood is pieces of roots, knots, &c., nicely fitted together in irregular shapes, and highly polished.

The Boot Mills, Lowell, started up about one-third of their machinery on the 7th inst., after having been idle nearly three months.

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Lake Superior Iron Ores.

A correspondent of the *U. S. Railroad and Mining Register* (Phila.) gives an exceedingly interesting account of the iron deposits of Lake Superior, from which we condense the following. He states that iron of that district belongs to a system of highly metamorphosed rocks, which has received the name of the "Azoic series," which was first applied by Sir R. Murchison and de Verneuil to the Scandinavian geology. This formation in the lake district contains similar ferruginous deposits to those of Sweden, northern New York and Missouri. These consist entirely of oxyds, either magnetic or specular, and are remarkable for their purity and freedom from those substances which are generally injurious to iron, such as arsenic, iron, sulphur, &c. In the geological report of Foster and Whitney the constituents of this ore are given as follows: Iron, 70.25; oxygen, 29.52; insoluble matter, 0.22. This is a rich and very pure specular ore, and no wonder a very large trade has sprung up within the past few years. The flourishing village of Marquette, on Lake Superior, is the entrepot of the iron trade; the chief deposits of the ore are about twelve miles distant from it, and are comprised within a series of crystalline schists, of which the surface breadth varies from six to twenty-five miles, and they extend west for about 150 miles. The deposits present no features of true veins; they are purely igneous products, and in some instances appear to have flowed up from the center of the earth. The eruptive origin of the great ore masses of Lake Superior is well supported by surrounding geological phenomena. The zone of the iron ore is limited north and south by granite ridges, which, in some places, attain an elevation of 1,000 feet above the lake.

A geological section of the iron mountains is exceedingly simple. Toward the north it is generally a quartzose mass intimately charged with ferriferous ores. The southern slope is a band of hornblende, resembling closely a crystalline schist. Often the layers of ore alternate with bands of jasper and ferruginous schists. In some other cases the geological section of the ore mountains will show alternations of chloritic schists, beds of compact peroxyd of iron, and of a compact and crystalline hornblendic and fieldspathic rock. It would naturally be expected that ore of such purity would produce metal of a very superior quality, especially when smelted with charcoal, and such is the case. In some experiments made to test this iron, its mean strength in pounds per square inch was found to be 89,582, which is about 31,000 pounds more than the good Salisbury and Swedish iron. Such a good quality of iron, however, has only been obtained from the very purest ores. Much of the iron which finds its way into the market labelled "Lake Superior iron," of an inferior quality, is made from an admixture of pure and impure ores not obtained from the Marquette district.

The mining of ore is of the simplest description, it being nothing more than a quarrying from the sides of the mountain. A railroad connects the iron quarries with the village of Marquette—the point of shipment—and is thirteen miles in length. Some of the ore is manufactured into pig, and shipped in that form. At Negaunee are two furnaces, at Collinsville one, at Forrestville one, and Chocolay one.

The cost of manufacturing pig iron at Collinsville and Forrestville where the machinery is operated by water power if $15.25 per tun put on board the vessel. The price of ore is only $1 87 per tun; labor, $2; coal, $7.50—the rest for hauling, &c. It will thus be noticed that coal is the item of greatest expense—amounting to one-half. The proportions of ore flux (lime) and charcoal used are, ore, 460 pounds; limestone, 30 pounds; charcoal, 21 bushels.

The amount of Lake Superior iron ore shipped from Marquette has been as follows:

For 1857 the product of iron ore was	27,000 tuns.
For 1858 the product of iron ore was	30,327 tuns.
For 1859 the product of iron ore was	80,000 tuns.
For 1860 the product of iron ore was	150,000 tuns.
Total for four years	287,327 tuns.

The manufacture of pig iron at Lake Superior has been as follows:

1858	2,000 tuns pigs.
1859	6,000 tuns pigs.
1860	5,000 tuns pigs.
In three years	13,000 tuns pigs.

In 1857 about 300 tuns of blooms were manufactured and then abandoned. The iron ores and the pig iron of Lake Superior are used extensively in Ohio and western Pennsylvania to mix with other ores in smelting and other qualities of pig iron in castings.

Sir William Armstrong on Ship's Armor.

At a meeting of Mechanical Engineers, held at sheffield, England, on Wednesday July 31st, Sir Wm. Armstrong made some remarks from which we extract the following:—"With regard to the great question of the ultimate effect of artillery against ships protected by defensive armor, I believe that whatever thickness of iron may be adopted, guns will be constructed capable of destroying it. At the same time I am of opinion that iron-plated ships will be infinitely more secure against artillery than timber ships. The former will effectively resist every species of explosive or incendiary projectile, as well as solid shot from all but the heaviest guns, which can never be used in large numbers against them. In short, it appears to me to be a question between plated ships or none at all, at any rate so far as line-of-battle ships are concerned. With respect to the quality of the material best adapted to resist the impact of shot, this subject is engaging much attention in the town of Sheffield and the iron districts generally. So far as my own observation and experience go, I may say that hardness and lamination are the conditions most essential to avoid. In striking a plate the tendency of the shot is to fracture rather than to pierce the material. When penetration is effected, the hole is of a broken character, and not such as would be made by the cutting action of a punch. The softer, therefore, the iron, the less injury it will sustain, and I apprehend that steel, in every form will, from its greater hardness, be found less effective than wrought iron, while its cost would be very much greater."

THE WAY THE GREAT EASTERN WAS SAVED.

The steamship *Great Eastern*, with a large number of passengers, left Liverpool for New York on Tuesday, Sept. 10, and continued on her course for two days, when she encountered a terrific gale, and the beating of the waves against the broad rudder soon broke her rudder post, when she fell off into the trough of the sea and rolled frightfully, tossing her passengers from side to side, and breaking the limbs of a considerable number. In the turmoil the officers, especially the commander, Capt. Walker, preserved their courage, and went coolly to work to repair the disaster. The first plan adopted was the well known device of throwing overboard a heavy spar with a hawser attached to each end; the two hawsers being brought up on opposite sides of the vessel. On trial it was found that the largest spar had no more effect on the *Great Eastern* than a toothpick would exert upon a whale boat. There was among the passengers a civil engineer, Mr. Hamilton E. Towle, of Boston, a graduate of the Lawrence Scientific School, who thought that he would go down between the decks and examine the arrangements of the rudder, to see if he could devise any plan for again obtaining control of this all-important organ of the ship. Working his way aft by the light of a lamp, he found the remaining portion of the rudder post.

The rudder of the *Great Eastern* weighs thirty tuns, and instead of being attached to the ship in the ordinary way, by pintles, it is supported by a collar resting upon friction rollers, the lower end being stepped in a shoe which extends backward from the bottom of the vessel. The arrangement is represented in the accompanying engravings, *a* being the rudder post of wrought iron, ten inches in diameter, and *c* the supporting collar, of which Fig. 3 is an enlarged perspective. This collar is of cast iron, and consists of a central sleeve fitting upon the rudder post; a flat bottom plate, with a groove for the rollers, and six radiating flanges, two inches in thickness. It is 18 inches in hight, of conical form, pretty closely resembling in shape a church bell. This conical collar is keyed to the rudder stem and secured by a massive nut, *e*, Fig. 3, 15 inches in diameter and 12 inches in length, which is screwed on the post above the collar. It was just above this nut that the rudder stem was broken, the fracture extending downward into the nut. The idea occurred to Mr. Towle that a large chain cable might be wrapped around the collar and connected with pulleys, and in this way the rudder might be controlled. The objection to this plan was the small size of the collar (2 feet 9 inches in diameter at the base and 15 inches at the top), giving a very short lever to resist the tremendous power of the waves against the broad rudder. This difficulty Mr. Towle thought he would overcome by wrapping successive coils of cable around the collar until he had obtained a diameter sufficient to give him the leverage required. He examined the collar to see if the cable could be secured to it, and fortunately found holes some three inches in diameter through the bottom plate—a hole between each pair of the radial flanges. The plan that he formed was to place one end of each alternate link of a heavy cable between each pair of the radial flanges of the collar, and secure the link in place by lashing it with a smaller chain passed repeatedly through the holes and around the flange and link. He measured the several parts and then went down into the hold and measured the largest cable. The tiller was 18 feet long, and the chain provided to operate it was one-ninth the size of the main cable, requiring a drum 4 feet in diameter in order to give a length of lever proportioned to the strength of the cable. Mr. Towle made a complete drawing of his plan and carried it to the stateroom of the First Engineer of the ship, and in the most respectful manner possible submitted it to him. The Engineer very gruffly told Mr. Towle that the plan would not work. He said, "That collar is so conical that your chain will slip right up, and will not hold." Mr. Towle informed the Engineer that he had just examined the parts and was satisfied that the chain could be secured. But the Engineer gave him the cold shoulder, and he returned on deck. On explaining the plan to Mr. Irving Grinnell and some other of his fellow-passengers, he was urged very strongly to present it to Capt. Walker, but not desiring to receive another rebuff, he declined. Discovering some hours afterward that work was going on about the rudder post he went down again to see the operations. He found the engineer at work screwing off the nut, with the design of securing the lower tiller to the rudder post in its place. Seeing at once that this would probably allow the rudder to drop down into the sea and be lost, he returned on deck and told his friends that there was something going on below that had removed his delicacy, and that he was now ready to speak to the Captain. This was on Saturday, and Capt. Walker was in his room working up his noon observation. He told Mr. Towle that he would hear him in half an hour; but in the multiplicity of his engagements it was nearly night before he found time to attend to the matter. When he reached the scene of operations he found the nut had been raised about an inch and a quarter, and the rudder had settled down this distance. Capt. Walker stopped the operation, and issued orders that Mr. Towle should have all the men he wanted to carry his plan into execution. He took about forty men, and requested Capt. Walker to put on another gang to get the large cable out of the hold and pass it aft.

It was five o'clock in the evening when Mr. Towle commenced his operations, the awful scenes aboard the wallowing ship having continued for more than two days and nights. The first step was to screw back the nut to its place. There was a wrench on board fitted to the nut, having projections for entering holes drilled in the periphery of the nut. In conformity with all the proportions of the great ship, so massive was this wrench that, in order to handle it, it had to be slung by ropes from a timber overhead. Mr. Towle had the wrench swung in a proper position, with its outer end firmly lashed in place, and then as the rudder was turning the proper way the wrench was pushed into its hold on the nut, when the onward turning of the rudder screwed the post up through the nut. As the rudder started to turn back in the opposite direction the wrench was removed. By three hours labor in this manner the nut was screwed back to its place, the last turn carrying away the lashings, and sending the wrench rattling along the iron deck. In the meantime Capt. Walker had accomplished the great task of moving the massive cable back to the stern, and now appeared between the decks, asking Mr. Towle if he was ready for it. A hole was cut in the upper deck, the cable passed down, and then commenced the difficult labor of winding it upon the collar.

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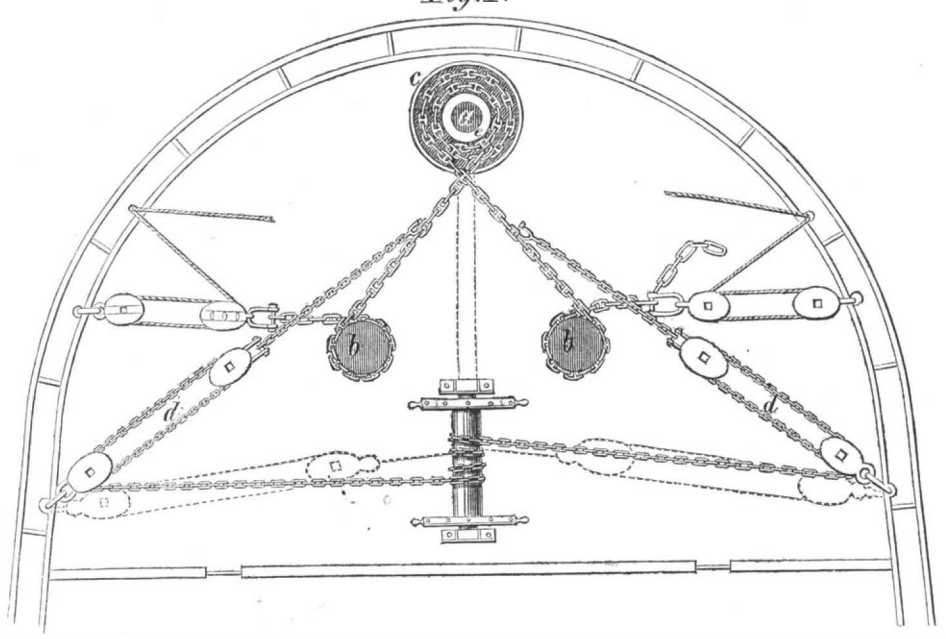
It must be remembered that beside the rolling of the ship, the rudder was being constantly beaten by the waves, turning the collar back and forth with resistless power, and thrashing the massive cable about the iron deck with a thundering rumble, which was compared to the roar of forty locomotives. The chain, too, was enormously heavy, each link weighing some sixty pounds. But the strength, courage and devotion of the men, under intelligent guidance, overcame all obstacles. The first coil around the collar was secured by lashings of smaller chains, these being passed through the holes in the bottom plate and around the flanges till the holes were filled with the chains. The second coil was secured in the same thorough manner to the first, and the third to the second, till a mass of chain, about four feet in diameter, was bound around the rudder. The ends of the cable were now carried around the two stout posts or bits, *b b*, Figs. 1 and 2, which were provided for holding the stern cable in mooring the ship, and connected with tackle for taking up the slack, while smaller chains attached to the two parts of the cable leading from the rudder post were connected through the tackle, *d d*, with the steering gear of the lower tiller. This labor was not only difficult but dangerous. Mr. Towle himself got his foot caught once, but the rudder happened fortunately to turn in the right direction to release him; had it turned the same distance in the opposite direction, the foot would have been crushed. With the exception of the assistance rendered personally by Capt. Walker, Mr. Towle did the whole of the lashing with his own hands. At half-past eleven o'clock, Mr. Towle informed the engineer that he was ready to steer the ship, and requested that steam might be put on, and the screw turned. The engineer desired that the chains should first be tightened in order to test their power to hold the rudder against the beating of the sea. This was accordingly done, and as the waves dashed at right angles against the wide rudder, the cable trembled and creaked under the tremendous strain; but it was so massive and so thoroughly bound, and the great bits around which it was wound were so strong and so well secured, that it proved equal to the work. The engineer, however, professed not to be satisfied, and insisted that the rudder should be held against the action of the waves for two or three hours. Mr. Towle refused to subject his work to this unnecessary trial, contending that as soon as the vessel should be moving, the rudder would be turned back by its passage through the water, and the waves no longer striking perpendicularly against it, the steering apparatus would be relieved from the principal part of its strain. Finding that the engineer had no authority to start the ship in any event, Mr. Towle went to the room of Capt. Walker, who had lain down for a short nap, and told him that the job was done, and requested him to start the ship. Capt. Walker asked the engineer if he thought that Mr. Towle's apparatus would hold, and the engineer gave his opinion that it would not; but said that in connection with an apparatus which he was arranging over the stern, he thought that the two together would hold. Capt. Walker accordingly gave the engineer authority to proceed in the construction of his apparatus.

Fig. 1.



TEMPORARY STEERING APPARATUS OF THE GREAT EASTERN.

This third plan of the engineer was suggested by a notch that had been broken in the edge of the rudder by its striking against the screw. A large cable was to be passed around the rudder so as to carry a shackle into the notch, and then, by bringing the ends of this chain on opposite sides of the vessel, it was thought that the rudder might be controlled. Nearly the whole of Sunday was consumed in this labor. The engineers were successful in getting the cable round the rudder, but the cable was so nearly vertical from the great hight of the decks, that, as soon as any strain was brought upon it, the shackle slipped out of the notch, and the whole labor was lost. About five o'clock in the afternoon, Capt. Walker came down and told Mr. Towle that they had failed in all their efforts; and then Mr. Towle renewed his request that the captain would order a few turns, at least, to be given to the screw. The order was given, and the great ship moved off, again under the perfect control of her commander's will. She swept around in a graceful circle, and then took up her course for Queenstown.

Fig. 2

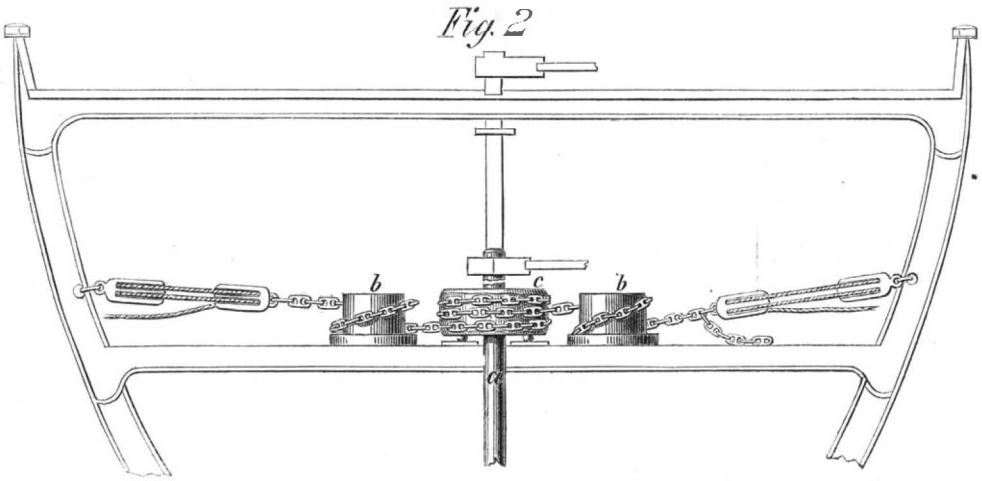
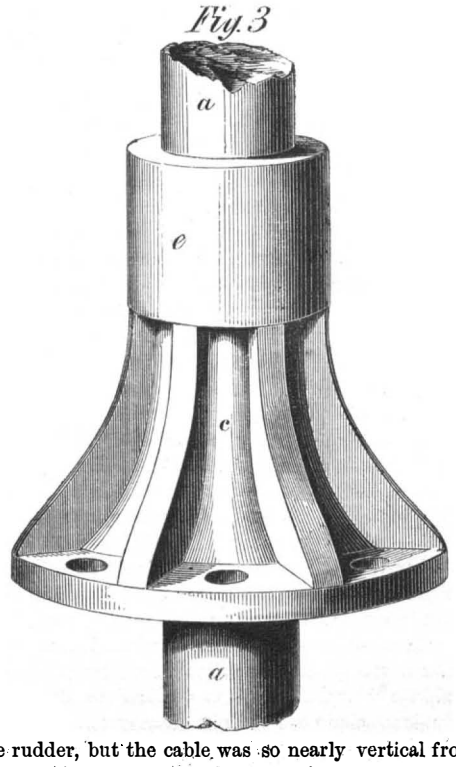


Fig. 3



As the passengers saw themselves rescued from the awful peril in which they had been so long involved, they crowded around Mr. Towle, pouring out their grateful congratulations. Mr. Towle is a young man, and he was so completely overcome that he was obliged to go away in private to escape the demonstrations. The intelligence and caution which he had employed in forming his plans, the opposition that he had encountered and the labor that he had expended in carrying them into effect, together with the vast amount of property and the great number of lives that were saved, combined to give a perfection to his triumph, and to excite feelings of satisfaction such as fall to the lot of few in the course of their lives.

The paddle wheels being destroyed by the waves, the vessel was propelled by the screw alone, but she moved steadily on her course and made nine knots an hour. During the voyage the steering apparatus required constant attention, great care being needed, especially to take up the slack in the main cable. If this became loose, a sudden turn of the rudder would snap off the smaller chain connected with the steering tackle, as if it were a piece of pack thread. The vessel arrived off Queenstown on Tuesday afternoon at four o'clock, with her passengers truly thankful for their great deliverance.

Mr. Towle wishes to record his appreciation of the worthy conduct of Mr. Brittain, the Chief Engineer of the screw engines, the same gentleman whose manliness was so conspicuous on the occasion of the investigation into the causes of the explosion on board of the *Great Eastern* on her trial trip.

Secret Steel Breastplate.

A divided breastplate, composed of thin spring steel confined between the cloth and the lining of a common military vest, was exhibited to us a few days since by Mr. J. S. Smith, an ingenious inventor and mechanic of this city. It is composed of two leaves which lap over at the edges where the vest is buttoned, so as to cover the entire chest. Being formed of thin spring steel plate, and weighing only 3½ lbs., it can be worn with ease by any officer or soldier during the most active exercise. It is very strong in proportion to its weight, as it can resist the thrust of a bayonet or sword, and it will repel the bullets of muskets and pistols at ranges which would otherwise be fatal to life. We saw it successfully resist a powerful thrust from a heavy steel-pointed pike. It answers every purpose of a light steel cuirass.

PITS in the earth, lined with masonry coated with sheet iron, have been successfully tried in France for the preservation of grain. The War Department had 576 quintals of wheat buried for 25 1-2 months, and it only lost 15lbs. in its weight.

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VOL. V. NO. 17.....[NEW SERIES.]....*Seventeenth Year.*

NEW YORK, SATURDAY, OCTOBER 26, 1861.

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AMERICAN, ENGLISH AND WHITWORTH RIFLES DESCRIBED AND CONTRASTED.

The ideas which prevail in England respecting the construction and use of rifles are quite different from those which rule in America. Here it is generally held that accurate shooting cannot be executed with light rifles, hence our gunsmiths make them with thick, heavy steel barrels. In England, on the other hand, light rifles are the rule and heavy ones the exception. At the celebrated national shooting match held at Wimbledon, no candidate for a prize was permitted to use a rifle of above ten pounds weight. In America it would be considered preposterous to attempt good shooting with such a light weapon. The very barrel of an American rifle is light when only ten pounds in weight. Some of the rifles used at Weehawken, near this city, by the Berdan sharpshooters, were of thirty and forty pounds weight.

A few days since we embraced the opportunity of examining specimens of the Whitworth breech-loading rifle, and the British volunteer rifle (short Enfield), at Mr. J. F. Milward's, Nos. 88 and 90 Reade street, this city. The Whitworth breech-loader has a chamber behind the breech; into this the cartridge is placed and pushed forward into the barrel by a sliding bolt, which is then fastened by giving it a half-screw turn. It is simple and well constructed to prevent leakage of gas at the breech, and it may be loaded and discharged rapidly. The barrel is round in form, 33 inches in length, and the metal is about the thickness of that in a rifled musket. The British volunteer rifle is a muzzle loader, plainly but strongly mounted, with a browned round iron barrel 33 inches long, and the metal about the same in thickness as the other. Both of these rifles are of the same bore as the Enfield, and are fitted with adjustable back sights for very long ranges. They are very neat and serviceable, but entirely different from American rifles, especially in the fabrication of their barrels, which are their most essential parts. The American rifles are usually made with thick, heavy barrels, octagon in form, and very small bores. They range from four-tenths up to five-tenths of an inch in caliber, while the English light barrels have calibers of 0.580 of an inch. The American thick barreled rifle carries a light, sharp, conical bullet; but the English rifle carries a heavy, blunt, expanding, conical bullet. Our American army rifle musket is similar to the Enfield, but we have been contrasting those which are more commonly used by the marksmen of both countries in prize shooting. The English charge is used in the form of a cartridge and the bullet is entered somewhat free. Loose powder covered with a patch, with the bullet swedged in at the muzzle, is the usual mode of charging American rifles.

In America, heavy rifles are used to prevent kicking, and the thick, octagon barrels to modify vibrations, as these tend to produce unsteadiness in firing. It appears to us that these principles should govern in the fabrication of rifles. The notions and practices of English gunsmiths and riflemen are quite different, however, from ours. They say, "If good shooting can be done with light rifles they should be preferred, because they are more convenient and easy to handle." They assert that by holding their rifles with a firmer *grip* against the shoulder, and by acquiring habits of steadiness in taking aim, all the asserted advantages of heavy rifles are secured for accuracy. They point to their Wimbledon targets and long ranges as proof of the good shooting which can be performed with ten-pound rifles, and they call the Enfield rifle, "the intellectual man's weapon," because so much depends on the care and judgment of the marksman in using it. Very heavy rifles which require a rest to use are not the weapons for soldiers or hunters. We have a contempt for any but off-hand rifle shooting. The best weight for a rifle according to its caliber is something respecting which rifle makers and riflemen are not settled in their opinion. We really would like to see an international shooting match got up between American and English riflemen, first in a trial with their own respective weapons, then with these exchanged between them. This would give us an exhibition of the real skill of the marksmen, and the peculiar qualities of their rifles.

THE NEW IRON-CLAD STEAMER FOR OUR NAVY.

Two weeks since we briefly noticed an article which appeared in the N. Y. *Herald*, respecting a new iron-clad gunboat, said to be now building at Mystic, Conn. Some further particulars have appeared in our cotemporary. They have been furnished by some friendly hand who has an exalted opinion that wisdom reigns in our Navy Department. If this wonderful gunboat shall be constructed according to the plan described in the *Herald* we really believe it will be the most novel craft that was ever sent forth upon American waters. It is brilliantly described as follows: "Standing at a little distance and looking at the vessel she will present not an unpleasant sight; but to look at her end-on she will look somewhat odd, and will resemble a class of vessels known many years ago as 'kettle bottoms.' In fact, if you were to take one of the old iron kettles in use twenty years ago and round it in at the top you would have a good model of one of the iron-clad vessel's sides." This is capital. We have heard about Diogenes and his tub, but American tars in a tea kettle is something more than this, and they will no doubt have a pleasant time of it when they get afloat. We have frequently heard of "a tempest in a teapot," but it remained for our naval authorities to get up an exhibition of a teapot in a tempest.

The framing of the hull of this vessel is to be of oak, and the armor is to consist of T-rails for ribs, upon which "plates of iron of a peculiar temper, four feet in width and one inch in thickness," are to be laid. This armor plating, we are told, is to cover "the entire upper portion of the vessel, and to serve for the upper and promenade deck." To promenade on the lid of a steam tea kettle, in a tempest at sea, or when an enemy may be pitching in bullets like "hot cakes" will be very exhilarating exercise for our tars. The armor plates are to be put on by a firm in Troy, N. Y. This armor-cased gunboat will be quite small, but according to the *Herald* it will be "superior to *La Gloire* and the British *Warrior*," which are "over six thousand tuns—great unwieldy vessels—and are good targets, while the American boats will be a little over a thousand tuns, and consequently presenting less surface to the marksman, and consequently less liable to damage." How elegant and precise the language, and how profound the wisdom of this nautical Nestor! Applying this logic to the construction of war vessels we may greatly improve all our frigates by reducing them to the size of jolly boats. The engines are to be constructed by C. H. Delamater, of this city.

It is stated that this vessel is only to be protected with iron to a short distance below the water line. This subject was lately brought before the British Scientific Association, when a member stated that he had seen a bolt shot from a Whitworth cannon which passed through thirty feet of water, then penetrated eight inches of oak. We advise that iron plates of one inch in thickness, or semi-steel plates three-fourths of an inch in thickness be carried down to the keel, so as to make sure of the engines being perfectly protected. It also appears to us that plates of two and a half inches thick for the upper armor would be superior to the T-rail ribs and the one-inch plating of this vessel. Bolts shot from rifled cannon will certainly smash through the outer thin plates if they strike between the rails. We believe conical shell may also pass through such spaces that would otherwise be resisted by two-inch plates of American charcoal iron. The great object of iron plating is to keep out shells—as an old tar once observed to Scott Russel, "Whatever you do, for God's sake keep out the shells."

Much has been said about constructing iron-cased vessels with angulated sides, to deflect the shot. Persons may be deceived by reviewing this question from a certain angle. The fact is that every vessel rolling in the sea presents various angles to the shot of an enemy. The curved sides of the Mystic gunboat are not wrong in theory, therefore, but the best that could be adopted.

THE DISASTER TO THE GREAT EASTERN.

It is the opinion of Mr. Towle, the civil engineer who designed the temporary steering apparatus of the *Great Eastern*, that the breaking of the rudder post at the precise point at which the fracture took place was, from the arrangement of the parts, certain to occur sooner or later. The rudder was supported by an iron collar firmly keyed to the post and secured by a large nut screwed snugly down upon the collar. At less than twelve inches above the nut the lower tiller was secured by a clasp to the rudder post. This tiller is a massive bar of iron, eighteen feet in length and weighing at least a tun and a half, its outer end being supported by a small roller running on a curved iron rail. Now, at every turn of the rudder this heavy tiller was swung by a torsion strain on the rudder post, the constant twisting in opposite directions subjecting the post to a very severe fatigue, which was confined to the short space between the nut and tiller. This action was steadily weakening the metal by disturbing the arrangement of its fibers; making its failure at this point a mere question of time.

CONGLOMERATE COPPER—GEOLOGY.

The *Mining Gazette* (Lake Superior) states that in the Portage Lake District there is a belt of conglomerate which is remarkably rich in copper. It says:—"It is a singular fact, that nearly every belt of conglomerate within the trap range in this district, and we believe in the country, has more or less copper. This is a very marked and singular mineralogical feature, and offers a field for investigation for the geologist and mineralogist, of very great interest. The conglomerate has not been, as yet, in any country, put down as a metalliferous bearing rock, and many questions arose on the discovery of the masses in the conglomerate belt at the Minnesota mine. It is still a question whether it may yet be more than the receptacle of mineral deposited from the real metalliferous rocks adjacent, which is a point of vast importance to the true knowledge of our veins, and is of great value in determining the value of a conglomerate lode, by a close examination of the overlying belts of trap, since the lodes are always over the conglomerate and are never under them."

That Is So.

The SCIENTIFIC AMERICAN is the only paper or periodical in the United States which publishes the patent claims. Persons interested in knowing what new inventions are being patented can get this information from no other source than through the columns of this paper. The lists of claims are furnished officially from the records of the Patent Office, for this paper only, and they can be relied on as being correct.

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DANGERS AND SAFETY OF COAL OIL.

Some very unscientific and unreasonable notions, which require correction, have lately been disseminated in the community concerning the nature of the oils obtained from petroleum wells. A few weeks since, as has been noticed in the columns of the SCIENTIFIC AMERICAN, an explosion took place on board of a schooner laden with such oil while lying at one of our docks, and subsequently to this event, about forty barrels of the same material took fire in the open street in Jersey City and were consumed. These events have caused the authorities of the above city to issue an order for confining the storage of all such oil arriving in that place within certain prescribed limits; and the insurance and railroad companies have taken the occasion to raise their rates for surety and for transport, pleading the explosive character of the oil as a reason for so doing. The erroneous notions spread abroad as to the dangerous nature of this oil are that it is liable to spontaneous combustion; also that it is explosive. Spontaneous combustion of cotton waste saturated with oil, has taken place frequently, but there is no case on record, to our knowledge, of oil in bulk taking fire spontaneously. The vapor of oil when saturated with eight volumes of the atmosphere, will explode if a lighted match or candle be brought into contact with it, but the oil itself will not explode. The explosion and burning referred to, occurred with unrefined petroleum oils obtained from the western ground wells. These oils contain a considerable quantity of benzole and naphtha, which are very volatile. We have been informed that the barrels containing the oils to which the accident occurred, had been left exposed to the hot sun and had leaked considerably at the seams. Their naphtha and benzole were thus permitted to vaporize, and the flame of a lamp in the hold of the schooner caused the explosion in the one case, and the match of a mischievous urchin perhaps set fire to the barrels in the other.

A very large export trade to Europe in petroleum oil has been inaugurated, and every reasonable encouragement should be given to it, because it may yet be the means of yielding a large national income. The oil wells of America extend over a vast region, and from them an unlimited supply may be obtained for many years to come. As it can be shipped and sold in England at lower prices than the oils obtained from distilled coal, it is reasonable to suppose that our American petroleum oil may, to a very large extent, be adopted and used in many parts of Europe for lubricating machinery and for illumination where gas is not used. Our railroad companies should therefore, offer every facility for its safe and cheap transport. With the exercise of proper care in keeping the barrels containing this oil perfectly covered, and by never permitting an open light to be brought into situations where it is stowed away, it may be carried with perfect safety.

THE METAL FOR IRON-CLAD SHIPS.

The chief object to be secured in the construction of iron-plated vessels is metal of a suitable quality for the armor. There are so many different kinds of iron and its compounds—steel—that without experiment it would be impossible to determine which sort is the best for resisting shot and shell. Happily, we are not without information on this subject. A series of very expensive and thorough experiments have been made by a committee appointed by the British government to test the strength of iron plates, and Sir J. D. Hay, R. N., has given a brief statement of some results obtained by these experiments. He has stated that the committee commenced with plates ¼ of an inch thick, and proceeded with an ascending series up to 10 inches in thickness. A variety of plates of the same thickness were obtained from different makers, so as to ascertain the best quality according to their weight. The result of these experiments went to show that the steely descriptions, such as semi-steel and homogeneous metal, which were extremely hard, possessed great resisting power up to about ¾ of an inch, but after that thickness had been attained, "its brittle nature rendered it less advantageous in resisting the blow of a projectile moving with a high velocity." Wrought iron of the best quality, which was soft and tenacious in character, was found to be the best, all things considered.

The charcoal iron plates, which have been prepared at St. Louis for the gunboats intended for the campaign on the Mississippi, appear to be of the very quality which the experiments of the British Admiralty committee have found to be the most suitable for resisting projectiles. At the same time these very experiments have also proven that thin semi-steel plates are very strong, and this leads us to conclude that the iron casing of gunboats and war ships may be improved by using thick soft iron plates for the upper works, and thin semi-steel plates under the water line. We should always endeavor to obtain the greatest strength with the least possible weight of metal, because a high speed is just as necessary to an efficient war vessel as strong sides, and every tun in weight saved in the armor is tantamount to an increase of speed, according to the model and power of the engines. As the best American charcoal iron, made from Lake Superior ore, is at least twenty-five per cent stronger than the best English, it follows that 3-inch American plates are as good as 4-inch foreign iron. With engines of the same power, and hulls of the same dimensions and model, we could build iron-plated frigates of equal strength and greater speed to those of other navies, simply on account of employing a superior metal for the armor. There is no doubt about the correctness of this conclusion; the question is as plain as A, B, C.

A STEAM CAR—ECONOMICAL RAILROADING.

On another page will be found an illustration of a steam car, which is in practical operation on the Camden and Amboy Railroad in New Jersey. It carries the engine which propels it, being a passenger and baggage car and locomotive all combined in one. The advantages of this plan are so manifest that they must have occurred to many persons. As each car would run independently of the others, the cars could be dispatched one at a time very often, instead of waiting to make up a train; thus making the departures much more frequent and giving increased accommodation to the community. The first place, doubtless, in which these cars will come into use is on the branch roads that serve as feeders to the main lines. On these a single car is generally sufficient to carry all of the passengers, and if this car can be propelled by a light and cheap engine carried on the car in place of the heavy and costly locomotive, a large saving will be effected both in the original outlay and in the current expense of running and repairs.

The difficulties which have heretofore prevented the practical use of like improvements in railroading have been principally owing to the bulk and weight of the propelling engine. The engine represented in our illustration is of surprising compactness, occupying but very little room. It is probable that further improvements in the engines may still be made.

The arrangement, gearing and combination of this engine, baggage, crate and passenger car, may still be improved, but the inventors of the plan we illustrate are evidently on the right track. We have strong hopes of seeing the cars of our city railroads propelled by steam on a similar plan. For this purpose the gearing employed in the car illustrated, to get up the speed, might be dispensed with, as high speed would not be desired. We look for a pretty wide adoption of this mode of propelling cars.

MILITARY INVENTIONS.

A great many excellent inventions in the military line have been developed since our national troubles commenced. Many of those which have been patented are already in extensive use in our army, and the patentees are reaping a rich harvest.

Other inventors of equally meritorious contrivances for army uses, refrain from securing protection by Letters Patent, on the ground that the war will probably be short, and that the demand for improvements in that line will then cease. Such reasoning is fallacious, for if our present difficulties are brought to a termination as early as the most hopeful predict, it will be public policy to have a national army of considerable force hereafter, and the monopoly of the manufacture and sale, for seventeen years (the time for which a patent is granted), of even so small an article as a belt buckle, which is of universal use in the service, would produce to the patentee a very handsome income; while improvements in other departments, of dress or equipment, would be still more profitable.

All the most effective weapons of warfare in use are the subjects of Letters Patent. We can call to mind the following variety of patented inventions which have been recently secured through this office, and are now in use in our army, many of which have been illustrated in these columns:—Cannon and projectiles, by Parrott and others; camp huts, tents, cots, rifles, pistols, ramrods, bayonets, camp chests, canteens, epaulets, stirrups, stoves and caps. Then there is Towers's patent spur for cavalry, and we presume some other inventions are in use, which were not patented through this office, concerning which we possess no knowledge.

The war is likely to develop ingenuity in its line equal to that which has been heretofore displayed in other departments of industry, and we can wish patentees no better success than to hope they will all make as much out of their war inventions as some patentees have realized from their patented agricultural machines.

VEXATIOUS DELAYS IN ISSUING PATENTS.

We are having letters daily from patentees complaining of the non-receipt of their Letters Patent from the Patent Office. They cannot understand why there should be such great delay in sending the documents after being informed that their patents are issued, and seeing their claims published in the SCIENTIFIC AMERICAN, and more especially when the Patent Office has not more than half its usual business. A paragraph at the head of the List of Claims in our paper explains the cause of delay, but that does not satisfy the restless anxiety of the patentee, who wants the document in hand.

We are sorry that the necessity for withholding patents after they are issueds hould arise; and yet the vast improvement in their appearance since they have been printed compensates for the delay in a great measure; but we see no need of their being retained so long as they are, and we hope the Commissioner will see that a reformation is effected in this respect.

By a letter from Washington of the 10th inst., we learn that a portion only of the patents of July 30th have been sent off, and none of August 6th. All of August 13th have gone, and some of August 20th are just ready to send. This arises from the irregularity with which they are received from the printer. Thus it would seem that some patentees whose claims were issued as long ago as July, have not been furnished with their patents, and none have been forwarded later than August 20th. There can be no good reason for such remissness, and we warn the Commissioner that unless he reforms this department of his bureau, he will find it necessary to reduce his own salary as well as that of the examiners and clerks in the various departments, which latter he has already done, if the expenditures of the office are to be kept within its receipts. Seriously, this reform is essential to the maintenance of the reputation of the office and that of the inventors of the country, who have heretofore more than supported this department—there being a large balance now in the Treasury to the credit of the Patent Office, the accumulated profits over the expenses of the Office during the past few years.

Paris City Telegraphs.

L'Invention states that it is proposed to form a company to enable the inhabitants of the several parts of Paris to communicate with each other by telegraph. A central bureau will be formed with wires radiating in every direction, and the messages will be first sent to this bureau and then dispatched to their destination. The large mercantile houses will be supplied with wires entering their counting rooms, and dispatches will be forwarded to distant cities and to foreign countries.

THE London *Mechanics' Magazine* asserts that Sir John Rennie was the first person who constructed a tonguing and grooving machine for matching timber. He used revolving cutters on this machine; this was in 1814. He was also the inventor of planing iron by machinery.

THE State of Ohio has in store, within sixty miles of Cincinnati, over eighteen tuns of musket and cannon powder, of the very best quality that can be manufactured. This is being held for any emergency that may occur.

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MEXICAN METHOD OF EXTRACTING SILVER FROM ORES.

The following is obtained from a cotemporary, which states it was taken from the correspondence of a San Francisco daily paper, the name of which is not given. It says:—

We will suppose the hacienda contains 50 arastras, 12 feet wide, each driven by two stout mules; which will reduce twenty tuns per diem, and necessitate the employment of 20 stamps, of about 125 pounds each, moved by 12 mules more. At 3 A. M., each arastra is charged with from 700 to 1,000 pounds of ore sand from the stamps (dependent on the degree of fineness), consisting of a mixture of all the ores obtainable from different mines—such mixture invariably facilitating the reduction, and diminishing the loss of silver and mercury. The requisite proportion of water being added, and this is an important point, the grinding is continued for 23 hours, or till the "lama,"—the pulverized ore, manifests no grittiness on being rubbed strongly against the thumb nail, and till a "tentadura," or trial sample, after being washed out in a little basin, leaves only an impalpable "asiento," or deposit of metallic particles. Should the slightest coarseness be perceptible, more water is added to thin the "lama," and the fluid portion is drawn off by a spigot, leaving the coarser deposit to be reground with the next charge. The ore mud having been left to drain till it attains the proper consistency, is incorporated with 5 to 6 arrobas per monton (4 to 5 per cent) of salt or an equivalent amount of saline earth, and spread out in round cakes of 25 to 100 montones, in the "patio,"—a large courtyard well paved with flags. Here it is left to absorb and dissolve the salt, and meanwhile portions are removed for the assay, by which the addition of quicksilver is regulated—the proportion being 7 to 8 pounds for every pound of silver present. The amount of silver obtained by a skillful manager is generally larger than that shown by assay,—an excess arising from several causes, which I have not space to enumerate. After remaining heaped up a greater or less space of time (usually 24 hours), the mercury is added in as fine a state of division as possible, together with about 25 pounds to each monton of "magistral," calcined copper pyrites, or —which is preferred by many—an equivalent quantity (say one-sixth) of crystallized sulphate of copper. It is now well trodden over by mules, horses, oxen or the feet of men, and left to operate. Mr. Parkman, an old Santa Fé trader, engaged for some years in silver reducing here, has invented and put into operation, to shorten this expensive and tedious operation, a very simple machine, which after two years' experience, leaves, he assures me, nothing to wish for. It consists of a pair of high wheels furnished with lateral arms, and so geared by rack work and pinion as to alternately advance and recede from the center while revolving. Another machine, with treaders, was invented by the Administrador of Barreras and ran for a few days, but on account of breaking the pavement was laid aside and abandoned. The loss of power in this treading process is immense, and if some smart Yankee could invent a simple, cheap and effective machine, that could not readily be broken, to accomplish the result aimed at, a perfect mixture of the ingredients with the ore —he could get a twenty-years' patent, the blessings of every "beneficiador" in Mexico, and, what is perhaps better, a handsome fortune in the bargain. The material being more or less conpounded—no globules of mercury being visible in the mass to the naked eye—the labor of the "azoguero" commences. Now comes the tug of war. The state of the "torta," if it requires "repasos," or salt or mercury, time to "cool," or magistral to "heat" it, are all determined by the "tentadura," or "panning out," and in this consists the entire success of the operation—the whole science of the "azoguero." After each new addition another repaso is given, and sometimes when no addition is necessary, and from time to time the amalgam is assayed to see if it indicates a gain of silver. When one or two marcs per torta is all that is gained per diem, and the "limadura," or fine particles of amalgam in the tail of the "tentadura" appears opaque, not lustrous, and, on being rubbed gently against the side of the bowl, gives off grains of running mercury, the "beneficio" is considered finished, and the torta is carried to the "lavadero," to be washed. This part of this process is important, as on it depends the saving of the silver already reduced and amalgamated. It is conducted on different principles in different parts with more or less perfect results. I will content myself with noticing the one most usual in Guanajuato. Four large tubs, built of staves or masonry, fifteen feet wide by four deep, are mounted over an arched vault, to catch the mercury, which infiltrates insensibly through the pores, and amounts to no insignificant sum per annum. These are open at the top, communicating by a series of apertures, six by eight inches, at about half their hight, and are provided with dashers placed on a vertical axis something resembling those of a barrel churn. The requisite quantity of ore being put in, the first water is added and the whole set slowly in motion. The amalgam mostly settles to the bottom, while the mud passes to the next of the sieves, where it deposits a little more; then to the third, which catches some of the most impure and the heavier sulphurets; then to the fourth, which receives hardly any at all. At the expiration of three hours the charge is drawn off, if completed, and a fresh one added, until the whole "torta" is washed, when the amalgam is removed and cleaned by hand washing in troughs or basins, preparatory to straining and distillation. In some haciendas the number of vats is only three, in others six; and still there is a trifling loss; while in Sonora we have only one, and the waste is consequently enormous. The amalgam, containing perhaps one-eighth or one-ninth of silver (the proportion of mercury being increased by an addition of fluid mercury, when necessary, to the lavadero, to catch the particles of amalgam, and called the "bano"), is placed in long, sleeve-like bags of strong canvas, drained and pressed by twisting, to exclude all the mercury possible, and made into balls or cakes for distillation. The expressed mercury is submitted a second time to the same filtering operation, and yields a small ball, one-fifth per cent generally remaining with the mercury. The dry amalgam, called "pella," contains from eighteen to twenty-eight (generally twenty-two) per cent of silver, dependent on the state of aggregation of this metal in the ore and the degree of pressure employed. The remaining operations of distillation and smelting are too well known to require description. The refuse of the washing vats, the "jal," or "cabecilla," as they call it here, was formerly permitted to run out into the creek and sold at about $8 or $10 the torta to a set of men named "despovilladores," or concentrators, whose business it was to extract the "povillos"—the metallic deposit containing silver and a little amalgam which escaped the vats—for sale to the original proprietors. This they did by heaping them up on a rude "table dormante," an inclined plane, about eight feet square. Having piled up the ore at the head of the table, the despovillador, seated at the foot, throws water gently on it with a horn spoon, and the light particles flow away with the stream, and are rejected, while the heavier arrange themselves near the place of original deposit, and after two or three washings are sufficiently concentrated for removal. After a preliminary washing, generally with salt, they are returned to the mills, or, when containing copper, used in the preparation of magistral. The quantity as well as richness varies wonderfully in different ores, or different grinding of the same ore, the former varying from ½ to 30 per cent. In Guanajuato, they are trifling—perhaps not over 2 per cent, and by the hand process cost six to eight reals the arroba of 25 pounds, but many haciendas have lately introduced a machine, something like an English buddle, in which the ores are ranged round the circumference of a great shallow basin of brick and mortar, and irrigated by many long tin tubes, projecting from a revolving cask filled with water in the center. When worked entirely by hand, it employs from three to four men, and reduces the cost of "povillos" to 15 or 20 cents the arroba.

The length of time required, in Guanajuato, to obtain the silver is form eighteen to forty days, according to the season, management and docility of the ores. The loss of silver on the first assay is variously stated from one to six (and in one case twelve) per cent, most of which is regained in the povillos; that of mercury fifteen to eighteen per cent of the amount employed, which is partly consumed (in the chemical reactions) and partly lost mechanically, amounting in some cases to 35 per cent of mercury and silver. The average fineness of the silver exclusive of the alloy of gold, half of which at least is lost in the patio, may be put down at 988-1,000. The whole expenses are averaged at forty-three per cent, for grinding alone; loss of mercury, ten per cent (amounting to over a million pounds annually, in Mexico); the product of silver being estimated at 900,005 pounds, extracted from 260,000 tuns of ore. Such an influence has the value and consequently the loss of mercury in the product of silver, that when the price of the former rose in the last century it diminished in six months the quantity of silver reduced fifty-five per cent, or more than half. In addition to the ingredients mentioned at the commencement, several others have been recently introduced to diminish the loss of mercury, and with considerable success. They consist chiefly of precipitated copper, and amalgams of zinc, copper, or iron, and are employed instead of lime to cool the tort. They have this advantage over lime, that the mercury, instead of being precipitated as an oxyd and lost, is partly revivified by the electro-positive metal, and augments the product. They were first introduced by Mr. Lauckner, some years ago, and from ignorance have met with much opposition, but their importance may be judged from the fact stated above, of the influeuce which slight fluctuations in the value of mercury alone have upon the economy of the process, and anything tending to diminish this source of expense would be felt immediately throughout the whole mining region.

National Encouragement to Novel Inventions.

[From the Philadelphia Inquirer.]

The present war bids fair to stimulate the inventive faculty of the American people as applied to the military arts. The government will of course have a number of new devices submitted to it, and among them it must be expected there will be a great deal of trash. Nevertheless, there may be wheat in the chaff, and the grain may be worth the labor of sifting. We regret to observe some indications of impatience on the part of the authorities at being pestered with these new projects, and it has indeed been said, that the government had concluded to eschew all novelties and stand in the beaten paths. We trust, however, that a just discrimination will be exercised and a proper encouragement extended to merit. War may be regarded as an applied science, and it is progressive like all other sciences. The existence of a state of war is naturally provocative of invention, and it is our duty, during its continuance, to accept the contributions of inventive skill, for we may be assured that war and not peace is the stimulus of such skill.

The successive steps in the development of the art of war have arisen altogether from the introduction of new implements and materials, all of which were novelties in their day. The sling, the bow, the javelin, the balister, the catapulta of antiquity, and the crossbow and the yew-bow of the middle ages, were extremely effective, yet the introduction of firearms and gunpowder wholly revolutionized that mode of warfare. The change, nevertheless, had its opponents. Marshal Saxe considered reliance upon the musket illusory, and Suwarrow accustomed his soldiers to look upon it as a mere folly, and to trust only to the bayonet. This may have been partly due to defectiveness of construction. The rifle is still an advance upon the musket, though the present Emperor of the French has expressed the opinion that, as it is dangerous only at a distance, it will not prevent the bayonet from being, as formerly, the terrible arm of the French infantry. In like manner, if we look at the artillery service, what a contrast between the rude cannon of boiled leather, as they were termed, used by Gustavus Adolphus in the victory of Leipzig and the splendid ordnance of modern times! These accurate and ponderous weapons have, by their caliber and range, modified the entire system of siege and of fortification, and their utility for military and naval purposes in general has been vastly increased by the novel construction of the projectiles.

Many of these valuable contributions were the productions of civilians, who were unfettered by the spirit of routine or by military habit, and whose free, critical and inventive tendencies accustomed them to detect defects and suggest improvements, without regard to the opinions or prejudices of military authorities, towards whom they stood in no relation of subordination, and for whose judgment they cared naught. Let our own government encourage the inventive skill of our people, and not disregard their novelties. Northern inventors have furnished the South with the machinery to clean and pack its cotton; let them now furnish a machine to clean out and pack off its Confederacy.

The British and French Armies.

France has a standing army of 400,000 men and 85,000 horses. England and her colonies. 212,000 men. According to recent official statements the total land forces of France amount to 400,000 of all ranks, and 5,658 *enfans de troupe*, independently of troops in French colonies (besides Algeria), whose numbers are not given, but whose cost is charged to the navy and colonial budget, and of 2,894 men, 663 horses, in the *Garde de Paris*. Classing all ranks, according to arms, in France and Algeria, and comparing them with a similar classification of the English forces, there will be :—

	France and Algeria.	England and Colonies.	England, Colonies and India.
Staff	4,607	1,222	1,222
Infantry	259,841	101,230	150,128
Cavalry	76,903	13,194	18,210
Artillery	37,873	22,393	28,520
Engineers	6,384	4,535	4,535
Train	5,655	1,909	1,909
Administrative services	8,737	1,561	1,561
Indian depots in England	....	....	6,688
Total	400,705	146,044	212,773
Horses	85,705	8,262	21,904

The French army expenses are equal to $100,000,000, while that of England is officially stated at $75,000,000.

Sulphur in Asthma.

Dr. Duclos, chemist and druggist, writing on this subject says:—"From all the facts observed and trials made, I formed this conclusion, that sulphur lotum is a wonderfully powerful preventative of asthma. All the cases in which I administered it have been modified; a certain number is entirely cured.

"The way I administer it, is this:—I prescribe the sulphur lotum in the daily dose of fifty centigrammes to one gramme, according to the age of the patient, to be taken once a day, in the morning before breakfast or at breakfast. This dose is continued for five or six months, twenty days every month; then for one year, eighteen months or two years, ten days only a month. It is impossible to imagine a simpler or more practical treatment. The remedy is well supported by the stomach, as a general thing; it produces neither vomiting, diarrhea, nor constipation. It seldom affects the bowels, and in very rare cases where it produces purgation, a combination of a small quantity of opium with it soon controls its bad effects. The sulphur lotum does not mix with water, in consequence of its lightness, and on that account water should be added gradually, drop by drop; or the remedy could be taken with a little confiture or a spoonful of soup."

NEW PROPELLER.—It is stated in the Cleveland (Ohio) *Plaindealer*, that an adjustable oscillating propeller for river and canal boats has lately been publicly exhibited by W. H. Welland, its inventor. It is easily adjusted for vessels of light and great draft, and this feature has received the approbation of many western boatmen who have examined it.

IT IS a popular belief that the hair of many persons has grown white in a single night from mental anguish. Scientific sceptics now assert that all such cases must have been due to a lack of evanescent hair dye.

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Improvements in Spinning Machinery.—Increased Wages.

In a recent edition of Dr. Ure's "History of the Cotton Manufacture," the following passage occurs relative to improvements in machinery for spinning more rapidly, and the necessary improvement in wages consequent thereon. He says: "In 1829, the spinner turned off three hundred and twelve pounds of yarn in the same time that he now takes to turn off six hundred and forty-eight. He was paid at the rate of 4s. 1d. in 1829; he is now paid at the rate of 2s. 5d. But three hundred and twelve pounds at 4s. 1d. amount to 1274s.; and six hundred and forty-eight pounds at 2s. 5d. amount to 1566s. He receives, therefore, 292s. more than he did in 1829, for equal times of work. No doubt he turns off 'more work, for less wages, than in 1829,' but this is nothing to the purpose, when the proposition to be proved is, that 'his weekly wages are lower than formerly.' It is demonstrable to the simplest capacity that a spinner earns a shilling, a pound, or a hundred pounds, in less time at present than he would have consumed in earning a shilling, a pound, or a hundred pounds ten years ago, and with the same, or more probably less labor; that this enhancement of his earnings has been owing to improvements in machinery; that the progress of improvement will progressively advance his earnings still higher, and at the same time enable a greater number of individuals to profit by the enhanced rate, than actually profit by the existing rate (provided that nothing occurs to prevent the cotton business from developing itself for the next thirty years as it has done for the last); and that any improvement in the machinery of any one of the numerous departments of cotton-working will operate to enhance the rate of wages in all other branches (as well as in that department in which it takes place), by increasing the actual demand for labor in those other previous branches. Every improvement of cotton machinery, in any department of the trade, has hitherto had the effect of enabling 'an operative' (speaking in general of every one in every department whatever) to earn a greater net amount of money, in any given time, than he would have done had the improvement never taken place."

Insect and Grain Eating Birds.

The French Senate has been engaged in a curious matter of practical natural history. Four petitions had been received, pressing upon the Minister of Agriculture and Commerce the importance of protecting those birds which destroy insects injurious to vines and corn. The committee had enjoyed the benefit of the knowledge and experience of M. Geoffroy St. Hilaire and M. Florent Prevost, and consequently the report was filled with matter most interesting to the farmer, the statesman, and the naturalist. In the first place, the report enumerates the various kinds of insects which in this country commit terrible ravages upon the most valuable products of the earth, including in the first rank corn, vines, and oil; the value of the wheat destroyed in a single season, in one department of the east of France, by the *cécidomigie*, had been established at four millions of francs. Instances were given to show the enormous fecundity of some of these pests. In a single specimen of the phlæoribus (the great enemy of the olive), a naturalist found 2,000 eggs. In Prussia the ravages of the norme were so great that an attempt was made to collect the eggs; and in one day, in a tract of forest land, four bushels, or about 180,000,000, were got together and destroyed. The crow is condemned in the report. This is counter to the opinion of scientific men in England, who praise the birds for eating insects, while the French condemn them as destroying other insect-eating birds. The gramnivorous birds, such as the sparrow, are considered to do more good by their destruction of insects and eggs than by the consumption of seeds. Owls, the woodpecker, swallow and singing birds, are recommended to protection.

The Nashua Manufacturing Company have contracted w th the government to furnish 300,000 cotton flannel drawers. This will furnish good employment for large numbers. They are all to be sewed by hand.

The Lawrence (Mass.) *Sentinel* says:—"With the exception of the Atlantic, the manufacturing business of our mills is but little behind that of ordinary times."

Return of the Arctic Expedition.

One evening in the early part of last week, while in conversation with a few scientific friends, the Arctic expedition under Dr. Hayes formed part of the discourse, and this led to inditing the brief paragraph which appeared on the subject in the last issue of the Scientific American. On the next day (the 10th), after going to press, the unexpected news came over the wires from Halifax, N. S., that Dr. Hayes and his companions had arrived at that place. Owing to great fields of dense ice south of the open Polar sea, which Dr. Kane had discovered, the party was unable to proceed further north. The expedition has, therefore, been inconclusive in its results, so far as it relates to extending our knowledge of the Polar sea. We have to lament the death of August Sentag, the distinguished artist, who was also one of Kane's companions in his Arctic explorations. We hope this will be the last expedition ever fitted out for the dangerous and uninhabitable frozen regions of the Arctic Circle.

There is still another American in the northern regions respecting whose fate much anxiety is felt. About the same time the Hayes expedition started Mr. Hall went out in the whaling ship *George Henry*, of New Bedford, on an exploring tour, he having formed the notion that he could adapt himself to the habits of the Esquimaux, and thus spend years among that people in pursuing his investigations by land in the Arctic wilds.

Concluding that some of Sir John Franklin's party were still alive, he decided to make the attempt to discover their location and aid them, if possible, in their return. He was to leave the *George Henry* at Cumberland Inlet, intending after that to live entirely as the Esquimaux do, using the dog-sled and an ice-boat, which he took with him, in journeying over the ice and open water. He intended to winter near Cumberland Inlet, and pursue his journey in the early spring. He spoke with no certainty as to the period of his return, and stated that no alarm should be felt if he should not be back in five years.

No information has been received of the ship *George Henry* since October, 1860; she is expected back next December.

Literature of Japan.—There are large public libraries in Japan, literature is common, and books are widely circulated. Thousands of illustrated novels are printed every year; and, to judge from the pictures with which they are profusely illustrated, they contain much the same ingredients as our own—love, murder, suicide, intrigue, heroism and folly. Their books are printed from wooden blocks on fine silky paper, doubled, so that the exterior sides only are printed upon. The Japanese are much further advanced in painting and drawing than the Chinese; they understand perspective, and many of their wood illustrations are both true to nature and well designed, in their peculiar style.

More British Territorial Acquisition.—The treaty with the King of Lagos for the cession of the isle and port of Lagos to Great Britain, is officially announced. This port of Lagos is one of the most valuable upon the African coast, its business amounting to upward of ten millions of dollars annually. It is a valuable acquisition for the British government, as it is the enterport to a rich country, and probably one of the finest cotton growing regions of the world. A large amount of excellent cotton was shipped from this port last year.

The *Western Railroad Gazette* says that from twelve to fifteen tuns of raspberry jam, and from three to four hundred gallons of raspberry wine, are made annually on Sugar Island in the Sault St. Marie River. The raspberries are gathered by the Indians, and the jam is made by Mr. P. S. Church, who sends it to Chicago and other cities on the lakes.

What a delightfully happy family is that at Fort Lafayette, where they live, the world shut out, as complacently as though not a trouble were agitating the country. Outside people, who are agitated by the various excitements of the day, know no such comfort as theirs.

At the recent Bristol county Fair the Mount Hope Iron Co., Somerset, Mass., exhibited a specimen of chain made wholly by machinery, without welding.

RECENT AMERICAN INVENTIONS.

Obtaining Light by Electricity.—Two patents on this subject appear in this week's issue, invented by J. T. Way, of Welbeck street, London, England. Heretofore in obtaining light by electricity, electrodes of charcoal have usually been employed, and motion has been given to such electrodes by means of clockwork or magnets, or both combined, so as to charge their acting points as they are consumed; but even with the best means yet employed for this purpose it is difficult if not impossible to obtain a constant light, owing to the want of uniformity in the electrodes. This defect is especially objectionable in the case of lighthouses and in other circumstances where lenses are used, as the path of the rays of light is continually changing, and the distance to which it penetrates will greatly vary from time to time. The mechani cal arrangements of electric lamps with charcoal electrodes are also of a delicate and complicated character and very liable to get out of order, and cannot be readily repaired by workmen of ordinary intelligence. The object of these inventions is to obviate the foregoing difficulties and objections, and to this end one of them consists in the use, for one of the electrodes, of a stream of mercury or other suitable conducting material capable of flowing, in combination with apparatus for regulating the distance apart of the two electrodes. This material is caused to flow through an orifice upon the surface of the conducting material which constitutes the second electrode. The said orifice and the second electrode are so adjusted relatively to each other that the surface of the second electrode is situated at a point where the separation of the particles of the stream commences. And another feature of the same invention consists in the use, for the second electrode, in combination with the flowing electrode, of a small overflowing cup or regulated surface of mercury or other suitable material similar to that of which the flowing electrode is composed. This material is received from the flowing electrode within the said cup or upon the said surface, and falls therefrom into a suitable receptacle from whence it may be returned to the receiver or cistern from which the flowing electrode is supplied. The other invention consists principally in the substitution for fixed electrodes of carbon or other material, of two flowing electrodes, such as two streams of mercury, one connected with each pole of the battery, and issuing in two jets; these streams meet each other at a point where the separation of the particles of either or both streams commences. Instead, however, of a single stream of mercury or other material, either of such flowing electrodes may be composed of two or more of such streams. L. L. Robinson, of Brooklyn, N. Y., is the agent for these inventions in this country.

Improved Pianoforte Action.—This invention consists in a detached elastic lever applied in combination with the hammer shank and the jack, for the purpose of returning the jack into the notch, but in a manner to permit of a very rapid repetition of the blow of the hammer. This invention is by H. S. Calenberg, of New York City.

The Montreal *Advertiser* states that before the close of navigation, this season, the magazines at Quebec will be filled with an amount of military stores greater than they ever held before, and with arms, cannon and equipments for an army of 100,000 men, and ammunition sufficient for a war of three years' duration.

The Canada Great Western Railroad is about to replace all the ties upon its line with white oak and the company are now advertising for 150,000. The ties formerly used on Canadian railways are hemlock, black ash and tamarack, the first two of which decay rapidly.

The statement recently made in eastern papers, that a party of secessionists attacked one of the California overland coaches, is utterly false. The employés of the company, numbering some hundreds, have all recently taken the oath of allegiance.

Dr. Winship lately lifted a platform on which stood twelve men, the whole weighing 1,900 pounds. The doctor is fast becoming a very Samson.

Queen Victoria now reigns over 174,000,000 of people. Of this number British India has 135,000,000.

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Patent Claims

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING OCTOBER 8, 1861.

Reported Officially for the Scientific American.

PATENTEES, READ THIS.

The new Patent Laws which went into force on the 2d of March last, authorized the Commissioner of Patents to have all the specifications which form part of the Letters Patent printed.

This is a wise provision, and it renders the documents much handsomer than the old system of engrossing them on parchment; besides, in passing before the printer and proof reader, the clerical errors, which were often made by the copyist, are mostly obviated, thus rendering the patent more likely to be correct.

But to afford the printer and proof reader an opportunity to do their work properly, the Patent Office is obliged to withhold the Letters Patent after granting them, from *four to six weeks* after the claims are published in the SCIENTIFIC AMERICAN.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 4, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

2,419.—William E. and H. G. Arnold, of Rochester, N. Y., for Improved Sash and Blind Fastener:

We claim the construction and arranging of the sliding back or backs, L, in combination with the box, A, and key or keys, for the purpose of locking the bolt, B, or slide, C, or their equivalent, either down or up, substantially as set forth and described.

We also claim the adjustable slide, C, when combined and arranged with the box, A, and bolt, B, so as at pleasure to hold the bolt, B, firmly when down, or let it be easily pushed inward and upward by a pressure on the outer end, substantially as described.

2,420.—J. W. Barker and J. P. Haskin, of Syracuse, N. Y., for an Improvement in the Purification of Common Salt:

We claim the mode of decomposing the impurities in manufactured salt by immersing or washing it in a solution of the carbonate or bicarbonate of potash or soda in saturated brine, as set forth, through which means the chemical results stated are produced.

2,421.—G. C. Barnes, of Battle Creek, Mich., for Improvement in Saw Mills:

I claim the employment of the adjustable frame, E, with saw mandrel secured in it, with the feed shaft, D, passing through the hollow journals of said frame, B, arranged and operating as and for the purpose specified.

2,422.—T. B. Butler, of Norwalk, Conn., for Improvement in Machinery for Forming Bats for Felt Cloth:

First, I claim the traveling carriage, E E E E, constructed and operated in the manner and for the purpose set forth.

Second, I also claim the double rack, g g, and the pinion, f, on the apron roll, j, or their equivalents for traversing the roll, j, across the main apron, C, in the manner and for the purpose set forth.

2,423.—H. S. Calenberg, of New York City, for Pianoforte Action:

I claim the detached elastic repeating lever, G, arranged relatively to the hammer and jack, upon a fixed fulcrum, d, and operating substantially as described.

2,424.—Edward and E. D. Dithridge, of Pittsburgh, Pa., for Improved Lamp Chimney:

We claim a new article of manufacture, consisting of a lamp chimney with a round base and top, and an oval-shaped bulge, arranged and constructed as described, for the purpose set forth.

[See engraving of this invention on another page.]

2,425.—B. C. English, of Hartford, Conn., for Improvement in Cartridge Cases:

I claim the application and use of a metallic bushing to the india-rubber cartridge case patented by Gilbert Smith, Patent 17,702, for the purposes described and set forth.

2,426.—Henry Feyh, of Columbus, Ohio, for Improvement in Hose Coupling:

I claim the combination of the semi-flanched adjusting thimble, C, constructed substantially as shown, with the butts, A B, as set forth.

[This invention consists in securing two butts together by means of a screw thimble provided with a flanch, the thimble being placed on one of the butts, and its flanch fitted in a recess in the exterior of the other butt, while the edge of one butt is provided with a packing in a groove into which an annular ledge on the other butt fits and is snugly adjusted as the thimble is screwed up.]

2,427.—Patent Suspended.

2,428.—Elisha Fitzgerald, of New York City, for Improvement in Mixing Dough:

I claim forcing the paste into the receiver, A, against the pressure of the gas, substantially as described and set forth.

2,429.—E. Heaton and J. L. Joyce, of New Haven, Conn., for Improvement in Boots and Shoes:

We claim a shank constructed of metal or other sufficiently rigid material, impervious to moisture, and applied to the uppers of boots and shoes independently of the heel and sole, and without an out-sole, substantially as described.

[The object of this invention is to economize in the stock of boots and shoes by dispensing with a great portion of the "out-sole" and all the "shank leather," also to give greater ease to the foot in walking, and to relieve the upper leather of much of the strain to which it is ordinarily subjected, and facilitate the manufacture of boots and shoes as well as the repairing the same when necessary.]

2,430.—J. A. Heyle, of Boston, Mass., for Improvement in Self-Acting Switches for Horse Railroads:

I claim, first, the curved depression, 1 2, in rail A′, constructed and operating substantially as described.

Second, In combination with the curved depression, 1 2, the depressions, 6 7, in flange, P and 8 9, in rail, B′, substantially as and for the object specified.

Third, The depressions, 5 6, in flange, P, and 3 4, in rail, A′, and the space, X, substantially as and for the object specified.

2,431.—B. F. Joslyn, of Worcester, Mass., for Improvements in Fire Arms:

First, I claim the breech, B, hinged to the end of the barrel and constructed substantially as set forth, so as to fit over the enlargement, e, on the end of the barrel in the manner and for the purpose specified.

Second, I claim forming a notch in the tongue, a, near its junction with the enlargement, e, of the barrel, and so forming the lower end of the portion, i, of the hinged breech that it shall fit to the notch as well as on each side of the tongue, as and for the purpose set forth.

Third, I claim the hinged breech with its projection, k, in combination with the bent spring, m, and its pin, n, the whole being arranged as set forth, for the purpose specified.

2,432.—E. G. Kinsley, of Stoughton, Mass, for Improvement in Flexible Soles:

I claim the series of metallic plates, B C D and E, in combination with rubber sole, A A′, the whole being constructed and arranged substantially in manner as described.

2,433.—N. D. Lamb, of Norwich, Conn., for Improvement in Alarm Whistles:

I claim letting the air into the receiver, B, without the hollow perforated tube, as described, for the purpose of giving marine signals by sounds, in the manner set forth.

2,434.—C. B. Lawrence, of Nunda, N. Y., for Improvement in Metallic Lubricating Compositions:

I claim the combination of antimony with any oleaginous substance, substantially as set forth, and for the purposes specified.

2,435.—T. E. Marble, of New York City, for Improvement in Sewing Machines:

I claim, in a combination of an eye-pointed needle and revolving hook or looper, used either in a single or double thread sewing machine, providing said hook or looper with a loop retainer or tension let-off, so constructed and applied as that it holds on to and controls the loop till it is drawn up by the action of the hook or needle or both hook and needle, essentially as set forth.

2,436.—T. J. Mayall, of Roxbury, Mass., for Improvement in Boot and Shoe Tips:

I claim the compound boot or shoe tip made substantially as described, by forming it of rubber or rubber coated cloth braced by and united with a cross web of linen, or its equivalent, essentially as and for the purpose or purposes set forth.

Also, thinning or gradually reducing the rubber tip at or toward its junction and finish with the cross web of the tip, substantially as shown and described.

2,437.—S. T. McDougall, of Brooklyn, N. Y., for Improved Washing Machine:

I claim, first, The employment of the frames, F and H, arranged in the tub, A, and having the reciprocating and vibrating motions imparted to them, respectively, by means of the cranks, 2 2 4 4, through the agency of the pitmans and rods, or equivalent mechanism, all arranged and operating substantially in the manner specified.

Second, The peculiar construction of the frames, as set forth, with balls and slats alternately arranged therein, substantially as described.

2,438.—Samuel McQuiston, of Morris, Ill., for Improvement in Corn Shellers:

I claim the shoe, E, discharging the cobs transversely of the planes of the wheels, when combined with a tight upper casing, A, inclined boards, g g h h, elevator, H, and discharging spout, I, arranged and operating in the manner and for the purposes set forth.

[This invention consists, first, in arranging the hopper box together with the feed plate in such a manner that the cobs are fed right into the throat instead of being discharged on the wheel. Second, in combining with the shelling wheels a riddle, to which the corn and the cobs are conducted by means of inclosed sideboards, and which serves to separate the corn from the cobs. Third, in the arrangement of the discharge of the cobs at the side of the machine, whereby a more perfect separation of corn and cobs is effected.]

2,439.—G. H. Mellen, of Hartford, Conn., for Improvement in Filtering Stopper:

I claim a filter and stopper combined in the manner and for the purpose described.

2,440.—B. F. Miller of New York City, for an Improved Bake Pan:

I claim the application of perforated metallic plates or wire gauze and earthenware structures as described for the purpose of constituting the bottom, and when desirable, the sides of the "baking pan or dish," and the same kept from contact with the bottom or floor of the oven.

I also claim in combination with the aforesaid structures, a perforated metallic, or sieve-like cover or lid as set forth and described.

2,441.—Merritt P. Morgan, of Scott, N. Y., for an Improvement in Straw Carriers of Thrashing Machines:

I claim my improved method of raising and supporting the straw carriers of thrashing machines by means of the windlass, F, standards, D D, and ropes, I I, or their equivalents, combined and arranged substantially as and for the purpose shown and described.

2,442.—John W. Nystrom, of Philadelphia, Pa., for an Improvement in Furnaces for the Manufacture of Iron and Steel:

I claim, first, The construction and arrangement of furnaces capable of rotation upon a horizontal axis and having tuyeres so arranged in an inclined position, that the blast enters the molten iron tangentially or nearly so to the curved bottom of such furnaces.

Second, The combination with a barrel furnace constructed and arranged essentially as described, of a front plate capable of removal, substantially as and for the purpose set forth.

Third, Providing a barrel furnace arranged and operated as described with a friction strap or its mechanical equivalent, to firmly hold and prevent shaking of the furnace during the operation of decarbonization, substantially as set forth.

Fourth, In combination with a furnace capable of rotation as described, and provided with a mouth for the reception of the molten metal from the cupola. I claim the side chimney on the cupola so arranged, that the said mouth shall come in juxtaposition with and convey the gases to the chimney as described.

Fifth, So forming and arranging the outlet of a barrel furnace constructed and operated as described, so that it shall occupy, when the furnace is in position to be emptied, the lowest part of the concave bottom.

2,443.—A. Odell and W. A. Burrows, of New York City, for an Improvement in Lamps:

We claim the use of the combination of the burner or pipe, a, conical reflector, b, and concave reflector, d, and equivalents when used for the same purposes described and in like combination.

2,444.—Stephen J. Patterson, of Bridgeport, Conn., for an Improvement in Apparatus for Tanning:

I claim, first, Attaching to the top of a tanner's vat a frame hung upon its center substantially as described, so arranged and constructed that the hides to be tanned may be suspended from said frame, and may be set in motion by rocking said frame upon its center.

Second, I also claim in combination with the rocking frame the paddles, I I, substantially as and for the purpose described.

2,445.—Abraham P. Quackenbush, of Brooklyn, N. Y., for an Improved Washing Machine:

I claim the construction and use in washing machines of a rubber or wheel having fixed cylinders, c, equal in size and in distance from the center to the rollers, E, and alternating with the latter or with pairs or triplets thereof as shown, in combination with rollers, D, so mounted as to form a concave for the purpose above set forth.

2,446.—Riley Root, of Galesburg, Ill., for an Improvement in Process of Clarifying Saccharine Juices:

I claim the use of native clay as an agent for clarifying Chinese and other cane juices, substantially as specified.

2,447.—Jeremiah Rohrer, of Middletown, Pa., for an Improvement in Bee Hives:

I claim, first, The combination of the air chamber, C, working chamber, B, provided with the ventilating and cut-off slides and apertures, F m n n g g k, air spaces, o p q r, and ventilator, I, all arranged in the manner and for the purposes described.

Second, The combination with the working chamber, B, of the ventilator, F, which consists of an oblong slot, b, perforated plate, m, the divided slide, n n, the whole being arranged on the front of the working chamber, B, and within the outer casing, A, in the manner and for the purpose described.

Third, The combination with the working chamber, B, and stop pins, k, thereof of the slides, g, which are perforated and have a notch, j, in one of their edges in the manner and for the purpose described.

2,448.—Charles Richardson, of Auburn, N. Y., for an Improved Machine for Rolling Horse-shoe Iron:

I claim so shaping the grooves in the rolls as to roll out a bar of the form in cross section as that shown in Fig. 5, and filling out the slack corner between the points, 2 3, by the after creasing of said bar, for the purpose and in the manner set forth.

2,449.—Henry E. Richards, of Newark, N. J., for an Improvement in Coffee Roasters:

I claim, first, The combination and use of the pipe, X, and the retort, D, substantially in the manner and for the purposes described.

Second, I claim the combination of the canister, E, retort, D, and pipe, X, substantially in the manner and for the purposes described.

2,450.—Daniel Sheets and John B. Pressey, of Buffalo, N. Y., for an Improvement in the Fastening of the Handles of Mining Picks:

I claim, first, The removable shank, B, as a means of connecting and fastening the pick blade to its handle, substantially as described.

Second, The combination of the removable shank, B, with the pick blade, A, socket, D, and key, C, for the purposes set forth.

2,451.—Thaddeus Selleck and W. H. Butler, of Greenwich, Conn., for an Improvement in the Construction of Burglar-proof Safes:

I claim the employment of the above described Franklinite or other similarly constituted metal, either alone or in combination with wrought or cast iron, in the construction of burglar-proof safes and analogous burglar-proof structures, substantially as and for the purposes specified.

2,452.—Alva Worden, of Ypsilanti, Mich., for an Improvement in Instruments for stretching Elastic Gaiters:

I claim the gaiter stretcher constructed, applied and operated, as described.

2,453.—John Thomas Way, of London, England, for an Improvement in Electric Light. Patented in England, April 23, 1857:

I claim the employment in obtaining light by electricity of two flowing electrodes, substantially as specified.

2,454.—John Thomas Way, of London, England, for an Improvement in Electric Light. Patented in England, May 4, 1857:

I claim the use of a flowing electrode of mercury or other suitable conducting material, in combination with apparatus for regulating the distance apart of the two electrodes, substantially as described.

And I also claim the combination of an overflowing cup or regulated surface of mercury as a second electrode, with a flowing electrode of mercury in apparatus for obtaining light by electricity, substantially as and for the purpose set forth.

2,455.—Maxamilian Wappich, of Sacramento, Cal., for Improved Marine Propeller:

I claim placing propeller shafts on each side of the vessel between the greatest width or beam and the rudder post, the shafts being supported by bearings from the stem, and having propellers whose blades increase in diameter from the front backwards, all as herein set forth.

2,456.—Nelson Van Deventer, of New Albany, Ind., for Improvement in Excavators for Water Courses having Currents:

I claim the combination of the rotary shaft, f′, disks, f, with teeth set obliquely, and rings, i, securing the said disks, at a proper distance apart, the whole being constructed and arranged as herein shown and described, and operating in connection with the steamboat, A, pivoted frames, *c d*, and hoisting apparatus, b s e p, in the manner and for the purpose set forth.

2,457.—H. W. Chace (assignor to M. R. Chace), of Fall River, Mass., for Improved Curtain Fixture:

I claim a bracket or curtain rod supporter constructed substantially in manner as set forth, as a new article of manufacture not heretofore known.

2,458.—Moses H. Crane, of Roxbury, Mass., assignor to Edward G. Rogers, of Holliston, Mass., for Improvement in Tower Clocks:

I claim the above described application of the hour and intermediate wheels to the winding arbor, or hour-hand shaft, and so connecting the intermediate wheel with the hour wheel that the former may be readily disconnected from the latter, so as to allow the said intermediate wheel to be turned either forward or backward for the purpose of setting or adjusting the hands of the clock, the whole being substantially as set forth.

I also claim the application of the sprocket or chain wheel directly to the hour wheel shaft, in combination with the application or arrangement of the guide pulley as described, the whole being substantially as set forth.

2,459.—S. H. Drennon (assignor to L. A. Carmer), of New York City, for Improved Heads for Double Seaming:

I claim the combination of a separate, adjustable head, substantially as described, with a mandrel or stake for double seaming or other purpose.

2,460.—B. W. Franklin, of New York City, assignor to the American Hard Rubber Company, for Improvement in Vulcanizing Caoutchouc:

I claim the employment of a bath of wax, or equivalent substance, as a medium for applying the vulcanizing heat to the vulcanizing compounds of india rubber and other vulcanizable gums, substantially and for the purpose specified.

2,461.—W. P. Hunt and I. D. Spaulding (assignors to W. P. Hunt), of Boston, Mass., for Improved Steering Apparatus:

I claim, first, Forming the connection between the traversing nut, D, and the rudder head, by means of the spherically headed studs, H, and the sliding socket blocks, I, or in any combination of parts substantially equivalent to a universal joint, the said studs and blocks being constructed and arranged to operate substantially in the manner and for the purposes herein set forth.

Second, The arrangement of the springs, L, with reference to and in combination with the stands, E, said stands being rigidly connected to each other, and supporting the screw substantially as described.

Third, Clamping the elastic medium, P, within the rudder head, said head being constructed substantially as described for the purpose set forth.

2,462.—Peter Prescott (assignor to himself and C. H. Post), of Booneville, N. Y., for Improvement in Lathe for Turning Broom Handles:

I claim the arrangement of the pins, *i*, perforated flange H′, and sliding collar H, with the slotted circular plate G2; pivoted knife blocks, *k k*, and pivoted cutter carrier, *n*, as shown and described.

[This invention relates to certain novel improvements in machinery for rounding, and at the same time giving the desired tapering slope to broom handles.]

2,463.—Enoch Robinson, of Raynham, Mass., assignor to the Old Colony Iron Company, for Improved Machine for Bending Wood:

I claim the combination of the mould or former, P, P′, the spring supporters or compressers, M M′, with the bed plate and the sliding frame, K, the whole being constructed, arranged and made to operate together in manner and by means substantially as set forth.

2,464.—Joseph Short, 2d, of New York City, assignor to P. W. Neefus and H. R. Conklin, for Improvement in Knapsack, Overcoat and Tent:

I claim the formation of a water-proof overcoat, substantially as described, so that it may be easily and readily transformed into a cavalry roll, or a full and complete knapsack with haversack combined, or a water-proof tent, for the several purposes set forth.

2,465.—J. H. Doughty, of Adamsville, Ohio, for Improvement in Churns:

I claim the combination of the barrel, A, short, submerged inne

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cylinder, G, piston, K, valve-guarded apertures, *k f*, and radial channels, *d*, the whole being constructed and arranged as herein shown and described, and operating in the manner and for the purpose explained.

[The peculiarity of this invention consists in admitting the cream to a cylinder through valve-guarded ports of large size and ejecting it forcibly through contracted apertures in such a manner as to produce continuous forced circulation, and subject all parts of the cream to compression and friction, which result in the rapid formation of butter,

1,857.—S. M. Davis, of Lawrence, Mass., assigner to A. L. Haskell, of Chelsea, Mass., for Improvement in Tents. Patented July 23, 1861.

I claim a folding adjustable tent made and operating as herein shown and described.

[The object of this invention is to obtain a tent frame which may be erected with great facility, raised or lowered on its pole, so as to form a more or less open or a close tent, as may be desired, and one that may rotate on its pole.]

RE-ISSUE.

123.—H. B. Myer, of Cleveland, Ohio, for Improvement in Converting Railroad Car Seats into Beds or Lounges. Patented May 3, 1859.

I claim, first, The forming of berths in railroad cars by means of the backs of the transverse seats, substantially as described.

Second, The forming of berths in railroad cars by means of the transverse seats in combination with corresponding supplementary cushioned or uncushioned frames, or their equivalents, to fill up the spaces between the transverse seats, substantially as described.

124.—Bridget Leonard, administratrix of the estate of Andrew Leonard, deceased, of Kenosha, Wis., for an Improved mode of Casting Seamless Skeins for Wagons:

First, The manner substantially as herein described of producing the core, I, which gives the internal form of the axle skein, and that part of the mould which gives the external form of the butt thereof.

Second, The manner substantially as herein described of producing that part of the mould which gives the external form of the wearing part of the thimble skein.

Third, The manner substantially as herein described of producing an unbroken impression in sand, of the external shoulder, *a*, of the axle skein.

Fourth, The manner substantially as herein described of uniting the base of the green sand core with the lower section of the sand mould, which gives the external form to the thimble skein.

Fifth, The manner substantially as herein described of holding in true position or centering the green sand cores.

Sixth, The manner substantially as herein described of producing, as a whole, a sand mould which turns out in the one operation of casting a finished seamless and shouldered cast thimble skein.

125.—Bridget Leonard, administratrix of the estate of Andrew Leonard, deceased, of Kenosha, Wis., for Improved Cast Seamless Thimble Skeins for Wagons:

A cast seamless thimble skein, substantially such as specified, which is not made seamless by filing, turning, or otherwise being manipulated with after it leaves the mould.

DESIGNS.

110.—Eberhard Faber, of New York City, Design for Trade Mark on Lead Pencils.

111.—S. H. Sailor, of Philadelphia, Pa., assignor to Smith, Francis & Wells, of Springville, Pa., Design for an Egg Cylinder Stove.

112.—S. H. Sailor, of Philadelphia, Pa., assignor to Smith, Francis & Wells, of Springville, Pa., Design for a Gas-Burning Cylinder Stove.

113.—W. P. Uhlinger, of Philadelphia, Pa., Design for a School Desk.

Notes and Queries

H. & B., of Iowa.—The medium 12-pounder brass gun is 6 feet 6 inches in length, the caliber 4.6 inches diameter. The rule in constructing American cannon has been to make the length of barrel seventeen times that of the bore. At the present day the fabrication of cannon is in a transition state; twelve and fourteen-pound shot are now fired from 6-pounder cannon.

W. G., of Conn.—To obtain sulphureted hydrogen gas add some sulphuret of iron to dilute muriatic acid. In a short time afterward bubbles will begin to arise, and the gas passes off. Convey this into a receiver by a tube rising from the cover of the vessel. We cannot tell you where to obtain "legerdemain apparatus."

R. H. B., of N. Y.—"King's Lessons and Practical Notes on Steam," &c., published by F. A. Brady, No. 26 Ann street, this city, contains information for young engineers, such as you require.

J. W., of N. Y.—The "touch paper" used by pyrotechnists is made by dipping thin paper into a saturated solution of salt, peter, then drying it thoroughly. Such paper is very good for covering the lower ends of common cartridges.

A. K. R., of Ohio.—Phosphorized ether is obtained by keeping sulphuric ether in contact with some species of phosphorus for a few days in a well-stoppered vial. If a few drops of phosphorized ether be dropped on a lump of loaf sugar, and the latter placed in a glass of warm water, the surface when undulated will present the appearance of small waves on fire.

J. T. W., of Pa.—You state that the practice now pursued in the British navy to remove the scale from the boilers of steam frigates is to run off the water and admit highly heated steam into them, which acts upon the scale and disengages it; and you wish this system to be recommended to the engineers of the American navy. The fact is, this is an American invention, discovered several years ago by one of the engineers of the Collins' line of steamers.

J. A. C., of C. W.—A charge of electricity from a Leyden jar should pass through your induction coil and produce a spark at the outer extremeties, the same as a current from a voltaic battery. The resistance of the coil, however, must be less than that of the glass of the jar, and the current must be of sufficient intensity to overcome the resistance of the coil.

G. U., of Mass.—The best and cheapest non-conductor of heat is atmospheric air. To keep your attic warm in winter, ceil it on the lower side of the rafters with matched boards; or, if you prefer a cheaper plan, sew pieces of sheeting together till you have sufficient breadth to cover the whole room, tack this to your rafters and paste house paper all over it. At one time nearly all the houses in California were finished in this manner.

C. M. F., of Mass.—We answer your questions in order. First, It is impossible to find a rope or wire of precisely equal strength throughout its length, and in subjecting it to a tensile strain it will break in the weakest part. Second, A body moving with a reciprocating motion practically does stop a short time at the extremities of its passage, from the imperfections in the mechanism. It is said, theoretically, that if the mechanism was perfect, the rest would be for an infinitely shor space of time; but, in our opinion, there is no such thing as an infinitely short space of time—the expression is nonsense. Third, Excepting the friction, you would lose no more power in driving your second saw with a pitman than with a belt or gearing. Fourth, The circular saw has been in use a very long time. Fifth, The question whether inertia can properly be called a force, belongs to that class of questions that we used to discuss very earnestly when we were quite young; but we have long given up the practice of disputing about the meanings of words, leaving them to be settled by lexicographers. We find that there are far more than enough questions in regard to the truths of nature, to occupy all of the brain power that we have to spare beside editing this paper.

S.D., of N. Y.—There are a number of works on soap. The most elaborate is Morfit's treaties on soap and candles; price, $6. There is also a smaller work on the subject by Kurten; price, $1. Sold by Lindsay & Blakiston, Philadelphia.

J. R. E.—That a projectile rotating upon its axis tends to preserve its axis parallel to itself is the reason usually assigned by philosophers for the superior accuracy of rifled guns. It is found that balls shot from smooth bores rotate on an axis at right angles to the trajectory, and this causes the ball to deviate in the direction in which the front side of the ball moves in its rotation.

J. C., of Pa.—Pianos have been made with barrels, and have been played in the streets of New York like hand organs. Your perforated barrel and adjustable spring are new to us, and we think them patentable.

J. H. M., of Wis.—Iron pyrites is a chemical combination of iron and sulphur, and hence the proportions of the two elements are always the same. It is the bisulphuret, consisting of one atom of iron (ferrum), to two atoms of sulphur (Fe. S.2); and, as the weight of the sulphur atom is 16 times that of hydrogen, and of the iron atom 27 times, there are 32 lbs. of sulphur to 27 of iron, giving about 47 per cent of iron. Sulphuric acid is made from iron pyrites, but the substance is so abundant that it has little commercial value.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, Oct. 16, 1861:—

E. H., of Conn., $40; J. L., of Wis., $35; S. S. W., of Pa., $25; G. K., of Pa., $15; M. T. G., of Wis., $20; T. M., of N. Y., $25; C. Van N., of N. Y., $25; J. S., of N. Y., $30; H. McG., of N. Y., $10; T. H. R., of Vt., $15; S. H., of Conn., $15; L. M. D., of N. H., $20; P. & L., of Mich., $20; J. E., of Conn., $20; W. H., of Wis., $60; B. D. P., of Pa., $25; J. L. R., of Wis., $25; E. F., of Pa., $15; S. D. T., of Mass., $10; H. W., of Vt., $25; S. T. D., of N. J., $25; C. A., of N. Y., $40; J. & W. T., of Conn., $25; D. S., of N. Y., $40; H. W. B., of N. J., $15; W. M., of O., $20; S. H., of N. Y., $20; P. & T., of Md $43; W. A. B., of Wis., $15; E. M. & J. E. M., of N. Y., $25; J. P. D., of Iowa, $25; C. O. P., of Mass., $15; J. W., of Conn., $15; J. McE., of N. Y., $15; W. W., of N. J., $15; F. S. M., of N. Y., $15; A. J. A., of Wis., $20; C. C. & W., of R. I., $20; C. H. D., of Vt., $20; S. P. P., of N. Y., $25; B. F. S., of Wis., $20.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Oct. 9, to Wednesday, Oct. 16, 1861:—

C. E. S., of Md.; J. M. M., of N. Y.; S. S. W., of Pa.; G and H., of Mo.; A. K. T., of Mich.; S. B., of Conn.; G. R. S., of Wis.; S. P. P., of N. Y.; B. D. P., of Pa.; J. L. R., of Wis.; J. P. D., of Iowa; E. M. and J. E. M., of N. Y.; R. G. H., of Wis.; J. and W. T., of Conn.; S. T. D., of N. J.; C. Van N., of N. Y.; T. M., of N. Y.; H. W., of Vt.; S. D. T., of Mass.; J. W., of Conn.; H. H. W., of N. Y.; M. J. K., of N. Y.

TO OUR READERS.

Models are required to accompany applications for Patent under the new law, the same as formerly, except on Design Patents, when two good drawings are all that is required to accompany the petition, specification and oath, except the government fee.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

BACK NUMBERS AND VOLUMES OF THE SCIENTIFIC AMERICAN.—Volumes I., II. and III. (bound or unbound) may be had at this office and from all periodical dealers. Price, bound, $1.50 per volume. by mail, $2—which includes postage. Price in sheets, $1. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding.

BINDING.—We are prepared to bind volumes, in handsome covers, with illuminated sides, and to furnish covers for other binders. Price for binding, 50 cents. Price for covers, by mail, 50 cents; by express or delivered at the office, 40 cents.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York

RATES OF ADVERTISING.

Thirty Cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

CHANGE IN THE PATENT LAWS.

PATENTS GRANTED FOR SEVENTEEN YEARS.

The new Patent Laws enacted by Congress on the 4th of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for Design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time and on the most liberal terms.

Testimonials.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

MESSRS. MUNN & Co.:—Gentleman: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Extension of Patents.

Valuable Patents are annually expiring which might be extended and bring fortunes to the households of many a poor Inventor or his family. We have had much experience in procuring the extension of Patents; and, as an evidence of our success in this department, we would state that, in all our immense practice, we have lost but *two* cases, and these were unsuccessful from causes entirely beyond our control.

It is important that extension cases should be managed by attorneys of the utmost skill to insure success. All documents connected with extensions require to be carefully drawn up, as any discrepancy or untruth exhibited in the papers is very liable to defeat the application.

Of all business connected with Patents, it is most important that extensions should be intrusted only to those who have had long experience, and understand the kind of evidence to be furnished the Patent Office, and the manner of presenting it. The heirs of a deceased Patentee may apply for an extension. Parties should arrange for an application for an extension at least six months before the expiration of the Patent.

For further information as to terms and mode of procedure in obtaining an extension, address MUNN & CO., No. 37 Park-row, New York.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty

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are carefully examined, and a reply written corresponding with the acts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. Over 1,500 of these examinations were made last year through this Office, and as a measure of prudence and economy, we usually advise Inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our Branch Offices.

Interferences.

We offer our services to examine witnesses in cases of interference, to prepare arguments and appear before the Commissioner of Patents, or in the United States Court, as counsel in conducting interferences or appeals.

For further information, send for a copy of "*Hints to Inventors*," Furnished free. Address MUNN & CO., No. 37 Park-row, New York.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention. If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fee, by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co., No. 37 Park-row, New York.

The Validity of Patents.

Persons who are about purchasing Patent property, or Patentees who are about erecting extensive works for manufacturing under their Patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing Patent, before making large investments. Written opinions on the validity of Patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited For further particulars, address MUNN & CO., No. 37 Park-row, New York.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

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CRUDE PARAFFINE WANTED—FOR WHICH THE highest price will be paid for a good article well pressed. Address H. RYDER & CO., Patent Paraffine Candle Manufacturers, New Bedford, Mass. 12 tf

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NEW YORK OBSERVER FOR 1862.—IN ASKING the aid of all who may desire to extend the circulation of the *New York Observer*, it is proper for us to state distinctly the position it occupies with reference to the present condition of public affairs in our beloved country.

Having always maintained the duty of good citizens in all parts of the land to stand by the Constitution, in its spirit and letter, when that Constitution was assailed and its overthrow attempted, we accordingly at once gave a cordial support to the Government in its patriotic endeavor to assert its lawful authority over the whole land. Believing secession to be rebellion, and when attempted, as in this case, without adequate reasons, to be the highest crime, we hold

1. That the war was forced upon us by the unjustifiable rebellion of the seceding States.

2. That the Government, as the ordinance of God, must put down rebellion and uphold the Constitution in its integrity.

3. That every citizen is bound to support the Government under which he lives, in the struggle to reëstablish its authority over the whole country.

4. That the Constitution of the United States is the supreme law of the Government as well as of the people; that the war should be prosecuted solely to uphold the Constitution and in strict subordination to its provisions: and the war should be arrested, and peace concluded, just so soon as the people now in revolt will lay down their arms and submit to the Constitution and laws of the land.

The distinctive features of the *Observer* are,

1. It is printed on a double sheet, so as to make two complete newspapers, one devoted to secular and the other religious matters; and these may be separated so as to make two complete journals, while the price for both is no greater than is charged for many papers smaller than either one of the two.

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3. It gives a well-digested epitome of the News of the Day, Foreign and Domestic, prepared with great labor and care, so that the reader is sure to be put in possession of every event of interest and importance to the public.

The foreign correspondence of the *Observer* is unrivaled, and has long commanded the admiration of intelligent men.

TERMS FOR NEW SUBSCRIBERS.

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2. To the person obtaining subscribers we will give $1 for each new subscriber paying $2 50 in advance.

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Specimen numbers of the *New York Observer* will be sent gratis to any address that may be forwarded to us for that purpose.

The state of the country renders it important for us and desirable for the churches, that a new and earnest effort be made to extend the principles of good government and sound religious truth into all the families of the land. In every neighborhood there must be some who do not now take a religious newspaper, and who might with a little exertion be induced to subscribe.

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IRON PLANERS, ENGINE LATHES, AND OTHER MAchinists Tools, of superior quality, on hand and finishing, and for sale low; also, Harrison's Grain Mills. For descriptive circular, address NEW HAVEN MANUFACTURING CO., New Haven, Conn. 1 26

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MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The Hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise at our warehouse. NEW YORK BELTING AND PACKING COMPANY.
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FOR SALE OR EXCHANGE FOR A SMALL PLANER, a Milling Machine, for gun or similar work, of the best make, nearly new, and in complete order. WOOSTER & GLOVER, Birmingham, Conn. 16 3*

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MESSIEURS LES INVENTEURS—AVIS IMPORtant. Les Inventeurs non familiers avec la langue Anglaise et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence. MUNN & CO.,
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This valuable family medical work, containing 300 pages, has been revised and improved, and elegantly illustrated with beautifully colored Engravings of the human system. Sent by mail to any part of the country on receipt of 25 cents. It is a complete guide to all diseases, and their cure.
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One of the leading New York Journal says:—"The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition of the Manual It contains a number of colored anatomical plates, and is a complete family physician, the best and most compendious that we have ever seen. Dr. Buchan's famous work is not to be compared in value to this excellent adviser. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is predared at once to apply the proper remedies in case of sudden attack of sickness in the family. In the country a copy of the Manual of Health is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."

LIVE WITHOUT THE DOCTOR

SAVE MONEY AND GAIN HEALTH.—The expense and trouble consequent upon the necessity of employing a physician, is no small item in the yearly calculations of the head of a family.

The most of this, and in fact all, except when serious accidents require surgical operations, or where very violent vital diseases render an occasional call necessary, can be avoided by having the Graefenberg Manual of Health and an assortment of Graefenberg Medicines.

FAMILIES can save large sums in doctors' bills, and avoid much suffering, by using the Graefenberg Medicines and Manual of Health.—*New York Tribune.*

THE Graefenberg Manual of Health, together with their valuable series of Family Medicines, will enable a family to dispense in nine cases out of ten, with the cost of a physician.—*Observer.*

NEARLY fifteen years experience has gained for the Graefenberg Company's Institution the confidence and esteem of the American people, and the combination of professional treatment under the direct supervision of the Medical Board, with the preparation and sale of family medicines under authority of an act of the Legislature of New York, has formed a union of professional practice and commercial enterprise never before witnessed. At the present day the position of the Graefenberg Company's Medical Institute is unparalleled by that of any Public Charity or Medical college in the world.

THE Graefenberg Company wish it to be distinctly understood that their theory and practice is not based upon infallibility. What is claimed, and what is borne out by facts, is that the medicines are the result of the highest medical skill adapted to the compounding of simple and entirely vegetable medicinal preparations. The treatment is the most judicious application of these simple vegetable productions in aid of the great and equally simple laws of nature governing the human system in health and disease. In ninety-nine cases out of a hundred the Graefenberg treatment will certainly cure.

CONSULATE OF THE U. S. OF AMERICA, BOMBAY, Sept., 1860.
This is to certify that I am personally acquainted with J. F. Bridge, M. D., of the city of New York, and that he is a learned and skillful physician of high standing; and further, that I have used the Graefenberg Medicines according to directions given in the Graefenberg Manual of Health, for several years, to my entire satisfaction; and I can confidently recommend them to all who wish to save doctors' bills and enjoy good health. L. H. HATFIELD,
American Consul, Bombay.

THE Graefenberg Institute combines the sale of medicine, medical advice, and the reception of patients for treatment in the Institute Buildings, No. 2 Bond Street, N. Y. Many of the leading public men in the country have spoken in the highest terms of the Graefenberg Institution and its theory and practice. Others who are unacquainted with the medicines, but who are aware of the integrity and truthfulness of the Resident Physician, have permitted him to refer to them for the truth of what he may say. Among these last we have noticed the names of Horace Greeley, of the *Tribune;* Prof. M. P. Jewett, of the Vassar Female College, Poughkeepsie; the Rev. E. H. Chapin, D.D., of New York; Prof. A. P. Peabody, of Harvard University, &c.

WE, the undersigned citizens of the town of Persia, Cattaraugus County, N. Y., and the town of Collins, Erie County, N. Y., most cheerfully certify that we and our families have used the Graefenberg Family Medicines, and especially the Graefenberg Vegetable Pills, with the most gratifying results. We believe they justly merit the good qualities claimed for them by the Graefenberg Company, and would confidently recommend them to the public.

Signed by Geo. S. Hicker; Thomas J. Parker, physician; Abraham Sucker, farmer; I. P. Rollen, farmer; John Havens, merchant; Ely Page, farmer; Stephen Hooker, farmer; E. J. Goss, drover; G. F. Southwick, farmer; P. Walden, farmer; Wm. Griffiths, butcher; D. Grannis, wheelwright; Edwin P. Daily, builder; H. N. Hooker, merchant, John Barnheart, farmer; E. Van Dorke, cordwainer.

Sworn to before John B. Wilbor, Justice of Peace.

CERTIFICATE FROM THE GOVERNOR OF VIRGINIA.

I, William Smith, Governor of Virginia, certify and make known that Joseph Prentice—who signs a certificate relating to the Graefenberg Vegetable Pills—is the Clerk of the Court of this State. The said certificate embraces the names of the most reliable and responsible people in this community, and certifies to the invariable curative action of the Graefenberg Vegetable Pills, in the following diseases:—

Bilious Complaints, Asthma, Constipation, Dyspepsia, Erysipelas; Low, Nervous and Simple Fevers; Gastric Fevers, Gripes, Heartburn, Headache, Indigestion, Hysterics, Liver Complaint, Nervous Disorders, Neuralgia, Rheumatism, and all diseases arising from want of action in the digestive organs.

And I further testify that full credit and faith are due and ought to be given to said certificates.

In testimony whereof, I have subscribed my name, and caused the Great Seal of the State to be affixed hereunto.

Done at the city of Richmond, the twenty-second day of November, in the year of our Lord one thousand eight hundred and forty-eight, and of the Commonwealth the seventy-third.
WILLIAM SMITH, Governor.
By the Governor, Wm. H. Richardson, Sec. Com. and Keeper of the Seal.

☞ Four boxes of Graefenberg Pills will be sent to any part of the country, without expense, on the receipt of one dollar.

☞ On the receipt of $5, or upward, that amount of Graefenberg Medicine, at retail prices, will be sent to any place in the United States where there is an express line from New York, or from the General Agency, free of charge.

☞ Any of the Graefenberg Medicines, or information regarding the Institute, its terms, &c., may be had by addressing
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Resident Physician Graefenberg Institute,
7eowtf No. 2 Bond Street, New York.

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Coal Oil Lamp Explosions in England and America.

Some explosions of lamps employed for burning coal have lately taken place in England, as well as in America, and they have offered fruitful matter for legal and scientific investigation. An old gentleman named Montmorency D. Stokes and his wife, having lost their lives by such an explosion in London, his son, in giving testimony before the coroner, stated that while he (the witness) undertook to pour fresh paraffine oil into a lamp his father had lately purchased, his mother was holding in her hand a lighted match, which she accidentally dropped into the lamp, which immediately exploded with a hissing noise, shivering the globe and upper part of the lamp into fragments, breaking the windows and scattering the blazing fluid over various parts of the room. It set fire to the window sash and furniture, and the deceased were so frightfully burned that they soon afterward died from the effects in an hospital. The Paraffine Light Company, London, appeared before the coroner with Dr. Odling, an analytical chemist, and produced a sample of what was described as genuine paraffine oil, and another sample of oil, which it was asserted had been purchased by the deceased. By the insertion of a match into the paraffine oil it did not explode, but the other sample of oil did when the match was applied to it.

Dr. Odling then experimented with a part of the explosive oil which had been left untouched in the can, and an ordinary sample of the Paraffine Light Company's oil. The explosive substance gave off an explosive vapor in the ordinary temperature, whereas the latter oil did not; lighted matches set the explosive oil in a sheet of flame. He denied that the explosive substance was paraffine oil. It seemed a dangerous substitute, and to be petroleum oil; its gravity was about 0.794, but the paraffine oil was 0.820, making the oil that exploded to be 26° lower.

The jury in the case rendered a verdict that the deceased came to their death from the mortal effects of the explosion of *the vapor* of a substance called paraffine oil, which was not the paraffine oil sold by the Paraffine Light Company. This was a scientific verdict, because it stated that it was the vapor of the oil not the oil itself which exploded. All the explosive oils, so called, must become gaseous and be mixed with oxygen before they will explode. English chemists seem to make a distinction between paraffine and petroleum oil. By the former, they mean those oils obtained from the distillation of coal at a low heat; by the latter, they mean the oils obtained from ground wells. We believe the petroleum oils also contain paraffine, and that from coal oils and well oils various burning liquids of a high and low gravity are obtained. English chemists consider that mineral oil under a specific gravity of 0.815 should not be sold for burning, as it is as dangerous to use in lamps as the old explosive burning fluid composed of alcohol 85 per cent and refined turpentine 15. As several explosions from mineral oil vapors have taken place in New York as well as London—as has been noticed previously in our columns—we warn the manufacturers of such oils against selling any for common use in lamps that is of a low specific gravity. There is no excuse for their furnishing a dangerous article, because its specific gravity can be so easily determined.

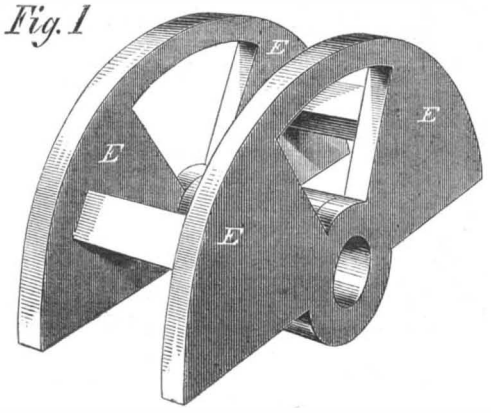
JOHN HUNTER, the great anatomist and surgeon, left a valuable collection of manuscripts, to the care of his brother-in-law, Sir Everard Howe, his executor, also a distinguished anatomist. Hunter's manuscrpts were secretly burned by this person, who, however, used them in his own lectures and business. It now turns out that a Mr. Clift, who was a student with Hunter, made copies of most of these manuscripts, and lately gave them to Prof. Owen, who has now published them. Sir Everard is execrated by the medical men of England for his base conduct.

A SUCCESSFUL COMPANY.—The *Commercial Bulletin*, Boston, states that the Amoskeag (N. H.) Manufacturing Company "after paying their second dividend this year have a quick capital left of $1,258,000, but will appropriate to the No. 6 Mill and a new dye house, to be built the next year, about $158,000, thus leaving over $1,100,000. The profits for the last year of this company were $418,000 on their whole capital of $8,000,000."

WHITE'S GOVERNOR VALVE.

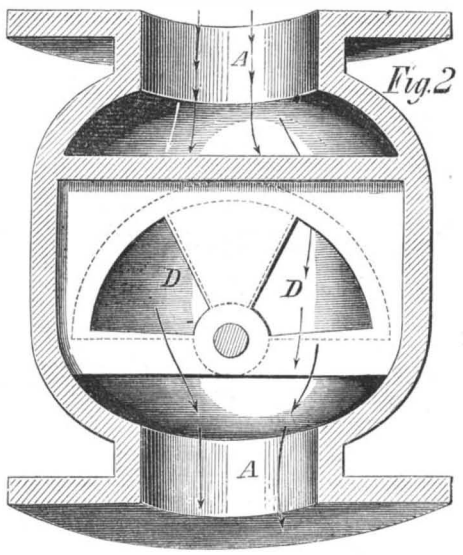
The accompanying engravings illustrate a valve for governing the speed of a steam engine invented by a practical engineer, A. White, of Geneseo, Ill. In relation to it the inventor says:—"It was not with a view of getting a patent that I invented my valve,

Fig. 1



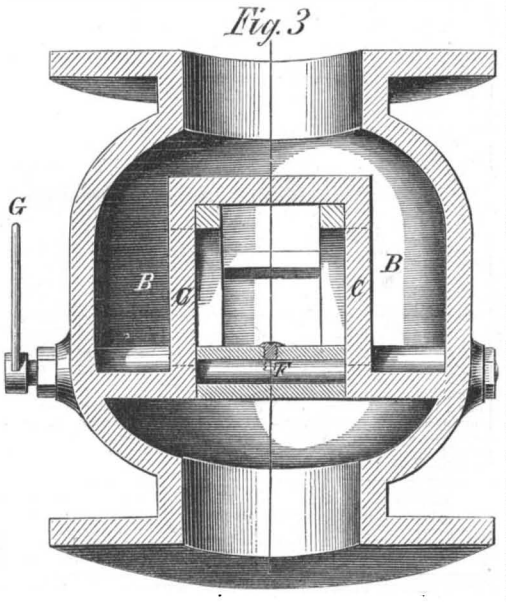
but because I could not procure a valve that was perfectly reliable under all circumstances. One class of valves required adjusting every time the steam varied 10 or 12 lbs. from a certain pressure; another class, called balance valves, would balance under a certain pressure, but would not under certain other pressures.

Fig. 2



I wished to obtain for my own use a valve that was very sensitive and would be perfectly balanced under any amount of steam I might wish to carry, and both these qualities are obtained in the construction of this valve and valve chamber. So perfect was it in all its operations, that, at the earnest solicitations of my friends, I applied for and obtained Letters Patent for

Fig. 3



it. I now offer it to the public, knowing from experience that it is what I claim it to be, really an anti-friction steam governor valve. I also claim that it cannot be surpassed as a thorough regulator, and that the principle on which it is balanced is the only true principle to produce a perfect balance. I obtain by its construction a valve that requires no attention after it is once put in operation, and that has no tendency to get out of repair."

Fig. 1 represents the valve, Fig. 2 the valve box, Fig. 3 the valve box at right angles to Fig. 2, with the valve in position. The steam pipe, A A, Fig. 2, is enlarged to receive the valve box, the enlargement being of sufficient size to permit the steam to flow down the space, B B, Fig. 3, on each side of the valve box. Through each of the two opposite walls, C C, of the valve box, two ports, D D, Fig. 2, are cut, making four ports opening into the valve box. These ports are closed by the portions, E E E E, Fig. 1, of the valve. The valve is secured rigidly upon the rockshaft, F, Fig. 3, which is connected by the lever, G, with the governor. It will be seen that any turning of the valve from its closed position opens all four ports, and opens them very rapidly; making this an exceedingly sensitive valve. As the steam presses equally against opposite sides of the valve, merely tending to crush the walls of the valve together, there is no surface rubbing under steam pressure, and hence the valve works with very little power and without any wear.

The patent for this invention was granted June 27, 1861, and further information in relation to it may be obtained by addressing White & Munson, at Geneseo, Ill.

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